RAILROAD GAZETTE

SATURDAY, JANUARY 8, 1876.

Contributions.

The Texas & Pacific and the Southern Pacific.

EXECUTIVE OFFICE, TEXAS & PACIFIC RAILWAY CO., PHILADELPHIA, Jan. 3, 1876.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I notice in your paper of the 18th of December an official letter of the Southern Pacific Railroad Company of California, that has been recently given to the public, over the signature of C. P. Huntington, agent and attorney, for the purpose, apparently, of forestalling public opinion upon the Texas & Pacific Railway Company's bill now before Congress; and as there are in the letter some statements that seem calculated to mislead, and some that require fuller information to enable them to be properly understood, I will, with your permission, submit a few facts and figures that may, perhaps, enable the public to more clearly comprehend the object and purpose of the letter, and of the action of Mr. Huntington in the matter.

The Southern Pacific Railroad Company of California was originally created to construct a railroad from San Francisco, by the most direct route *via* Tehachapa Pass and Los Angeles, to Fort Yuma on the Colorado River, there to connect with a trans-continental road to be constructed on the 32d parallel of latitude, which is the route of the Texas & Pacific Railway; and a branch was also authorized to Fort Mohave, there to connect with a similar line of railway from the east on the 35th parallel of latitude.

In October, 1870, the company consolidated with, and merged into itself, the property and franchises of the San Francisco & San Jose Railroad Company, the Santa Clara & Pajaro Valley Railroad Company, and the California Railroad Company, thereby increasing its total constructed and projected mileage to 1,371 miles, with Government grants under congressional acts, approved July 27, 1865, and March 3, 1871, of 12,800 acres of public lands per mile for 922 miles of its road, or 11,800,000 acres of land in all.

The Vice-President of the Central Pacific Railroad Company, Mr. Collis P. Huntington, was made President of this new Southern Pacific Company, and several other of the Central Pacific Railroad Company directors, and of its officers were chosen directors and officers of the new company; and the "Contract and Finance Company," the construction company that originally built the Central Pacific road, and in which Mr. Huntington and his associates are supposed to have a very warm interest, was given the contract to construct this Southern Pacific Railway, for which it was to receive $40,000 per mile in first-mortgage bonds, and an unknown quantity of its capital stock; the evident intent being to enable the Central Pacific Company to control, through this organization, the California end—from the east boundary line of the State of California to the Pacific Ocean, including all terminal facilities on the Pacific coast—of any railway company that should be authorized to construct a line of road between the Mississippi valley and the Pacific Ocean, through the territory south of the present Union and Central Pacific lines.

The direct route for a Southern Pacific road to connect San Francisco with the Texas & Pacific Railway at Fort Yuma is to follow the San Jose Valley southeastwardly from San Francisco to Carnadero, thence through San Juan and San Benito valleys to the San Benito Hills, and from thence eastwardly, turning these hills on the south side and Tulare Lake on the north side, to Goshen or Visalia, at the head of San Joaquin Valley, and from thence in a southerly direction, through Tehachapa Pass, to Los Angeles; and to secure the construction of this line was undoubtedly the original purpose of the government grants.

It is evident, however, that such a plan was not in accord with the policy and interest of the Central Pacific Railroad Company, as that company own the road from Oakland to Stockton, and also the San Joaquin Valley road extending from Lathrop, near Stockton, southeastwardly to Goshen, the head of the valley, making 228 miles of Central Pacific road between Oakland and Goshen that it was evidently for its interest to have put into the through line to Fort Yuma; and in order to secure this, the route of the San Jose Valley line was changed at Carnadero, from its natural course in a southeasterly direction, to almost due west, towards the bay of Monterey on the Pacific coast, and from thence it has been extended southwardly down the Salinas valley to Soledad, its present southern terminus, thus changing it from a through trunk line into a purely local road.

It was doubtless the same interest that has perverted the original charter of the Southern Pacific Company from its original intent to secure the construction of a direct line from San Francisco, by using it to construct what is practically an extension of the Central Pacific Company's 228 miles of San Joaquin Valley line terminating at Goshen, from that point southeastwardly through Tehachapa Pass to Los Angeles; and it is a part of this extension through Tehachapa Pass, from Caliente to San Fernando, 115 miles, that the company are now at work upon.

From Los Angeles, the Southern Pacific line passes through San Gorgonio Pass, down the Coahuilla valley southeastwardly to Fort Yuma, and it is a part of this division of its road, from the western entrance into San Gorgonio Pass to Fort Yuma, about 160 miles in length, that is in conflict with the Texas & Pacific line, and for which the claim is made that the Texas & Pacific Railway Company is asking for Government aid to construct a road alongside of another line that may be—but has not yet been—constructed with private capital.

How much work has been done between the west entrance to the pass and Fort Yuma I cannot state; but neither the official monthly publications of the General Ticket Agents' Association, nor the official reports of the company to the Government show that any considerable part of this 160 miles has yet been completed and opened to the public, although work in the pass is being prosecuted, as I have been informed, for the purpose of securing a choice of location for the Southern Pacific road.

From this statement, the accuracy of which can easily be ascertained from the records, you can judge what reliance should be placed upon the recent official statement of the Southern Pacific Railroad Company over the signature of Mr. Huntington, its former President, now its agent and attorney, and who is also the Vice-President of the Central Pacific Railroad Company, in which he says, "that the Southern Pacific Company is not a branch of the Central, but is entirely a distinct road, extending from San Francisco southeastward, toward the mouth of the Colorado River, where it will, if extended, meet the route of the Texas & Pacific Railway Company at Fort Yuma, 772 miles from San Francisco, *about 500 miles being now completed.*"

The disingenuousness of this statement certainly borders upon untruthfulness, when the facts as shown by the company's recent official report (published in the same number of your paper that contained his extraordinary letter) are, that instead of having 500 miles of completed line between San Francisco and Fort Yuma, as stated in the last paragraph, but 96 miles, from Goshen to Caliente, and 120 miles from San Fernando to White River, two disconnected sections of but 216 miles in all, of this through line, have as yet been built under the Southern Pacific charter. And of the San Jose Valley line, the true line from San Francisco, three separate links, of 162 miles, 115 miles and 136 miles, respectively, crossing three distinct mountain ranges, or 413 miles in all of the most costly part of the work remain to be completed to form a through connection; and it is safe to assume that the 162 miles between Soledad and Goshen, or Poso Junction, will not be completed in the present century: *First*, because from the great cost of its construction from the Salinas Valley across the Sierra Nevada Mountains, it is an impracticable route; and *second*, for the commercial reason, that as it has practically the same ownership as the San Joaquin Valley line, that has a connection through to Oakland on the opposite side of the bay from San Francisco, the increased business from its construction will not warrant the large expenditure required to complete it.

The official letter of the Southern Pacific Company before referred to is also conspicuously inexact in its representation that the Texas & Pacific Company is "asking for moneyed aid from the Government to build a road which must for a long distance run parallel to, and be designed to compete with that built at the Pacific end out of private capital, *by parties untainted by default of any kind, either to the Government or private creditors;* and seeking also to be absolved from the consequences of their neglect of voluntarily assumed obligations."

When it is remembered that this statement is made over the signature of a gentleman who was, until recently, the President of the Southern Pacific Railroad Company, and who now signs himself as its agent and attorney, and who holds the position of Vice-President of the Central Pacific Railroad Company, and who is also a director or one of the principal managers and manipulators of the California Pacific Railroad Company, and of the Placerville & Sacramento Valley Railroad Company, and is President of the Chesapeake & Ohio Railroad Company, the audacity of the statement as to "parties untainted by default of any kind," will be fully appreciated by the general public, and especially by the *bondholders* and other *creditors* of the *three last-named companies;* as it will also be by the *people of California*, in whose name a suit in the San Francisco Circuit Court is now pending against the Southern and Central Pacific railroad companies, to cancel and set aside the grant to them of the Mission Bay lands and water front in San Francisco, and the right of way thereto, on the ground, as alleged in the complaint, that these companies have not complied with the terms of the grant, and have not used it according to the original intention, and did not construct their respective roads leading thereto within the time prescribed by the act granting lands.

There are other inaccurate statements in the letter, but I will not take up time by referring to them in detail, as all were evidently intended to have their effect upon the main purpose of the letter, the bold proposition that the United States Government shall confiscate the grant of lands it has heretofore made to the Texas & Pacific Railway Company, and which is to-day a vested property of that company without taint of forfeiture, and give it, together with the right to construct a road between the Rio Grande and the Colorado River, to the Southern Pacific Railroad Company, upon its simple agreement that "they will promptly construct the same for the land grant attached thereto."

An equally modest proposition, and one similar in some respects, is described in the New Testament as having been made by a certain noted personage who offered to give all the kingdoms of the earth upon certain terms, the full particulars of which are recorded in the fourth chapter of St. Luke; and, as in that case, it was not the question of a want of power to make a delivery—although that might have been raised—so much as it was a want of confidence in the party making the proposition, and a belief that he was influenced by selfish rather than disinterested motives, that promoted the rather emphatic answer of "Get thee behind me;" so in this case, waiving consideration of the question of the power of the Government to take a vested franchise and property from the Texas & Pacific Company and give it to the Southern Pacific Company, it is respectfully submitted that there is nothing in the past history of this Southern Pacific Railroad Company of California, nor of its owners and promoters, as represented by Mr. Huntington, to warrant the General Government in continuing in their exclusive control the carrying of the transcontinental traffic of this whole continent, with the power to levy a tax upon it at will; and whether such enormous powers shall be continued to this combination or not is the question that Congress will decide by its action, or non-action, upon this remarkable Southern Pacific proposition; and upon the Texas & Pacific Railway bill, which guarantees great economies to the Government and the people for all time, and places the power to regulate rates for transportation with Congress, in such form that actual capital only is to be provided for; and all the speculative watering of the existing lines, which the Government and the people are now paying for daily in excessive rates, will be avoided for all time.

If evidence is wanted as to the manner in which Mr. Huntington and his friends have used their powers under the Central Pacific railroad company's charter, I will state that, in March last, immediately after the adjournment of Congress, when a bill in aid of the Texas & Pacific Railway, not nearly so perfect as the one now before that body, had been lost by reason of the manipulation of Mr. Huntington and his confreres, the mode of which was well understood at the time; and after the Pacific Mail Steamship subsidy act had been repealed, and the credit of that company destroyed, and the control of the Pacific Mail Company, the only competitor for the Pacific coast business with the Union and Central Pacific lines, had passed into the hands of the combination, new rates of freight on through traffic between San Francisco and New York were established; and from this can be judged both the power and the will of this combination to directly tax the people of this whole continent. An examination of the freight schedules of these companies, before and after the date referred to, will show an increase of rates charged the Government and the public of from 50 to 100 per cent. on all through freight traffic.

The direct result of this increase of charges was, that for the seven succeeding months, ending September 30, the two companies earned $18,107,133, against $14,944,173 for the corresponding months of the previous year; being an increase of $3,162,960 for the seven months, which is at the rate of $5,500,000 per annum; all of which represented an additional toll levied upon the Government and the public, whose money built the line; and nearly all must have been clear profit for the benefit of the combination, because of the increased rates, as the volume of business was not materially increased.

From these figures you can judge what strong reasons this combination of parties in the interests of the Southern and Central Pacific railway companies have, to prevent the passage by Congress of any bill that is designed to secure the completion of an independent line of railway across the continent, *upon which the rates for transportation of freight and passengers can be controlled by Congress;* and these companies can well afford to spend a considerable portion of their increased revenues so obtained by a forced contribution levied on the people, either in building additional road under their very liberal charter privileges, or in any other way that will serve to perpetuate their powers.

The fact that Mr. Huntington and his friends, with their extensive knowledge of that section of country and of its capability to furnish business for a road, are willing to undertake the construction of 600 miles of line between the Colorado River and the Rio Grande, with private capital, in addition to 913 miles, the uncompleted portion of the Southern Pacific line in California, that they have yet to build, very clearly demonstrates, either that they are satisfied the line will at least earn five per cent. interest on its cost, in which case there is no risk to the Government from the proposed guarantee; or else that they have some other interest than the simple investment of their surplus revenues to induce them to undertake the work; and as the Southern Pacific Company report the average traffic receipts of its completed road as exceeding $7,000 per mile in coin, for the last four years, with net income of upwards of $2,400 in coin per mile, it is very evident that they have an abiding faith that the road, if constructed under their management, will become a profitable investment, although its cost will be very heavy, if we are to accept Mr. Huntington's statement, that "during the past two years of financial depression they have constructed over 250 miles of road, which, with the work done in advance of track, and materials on the ground and in transit, represents an outlay of *twenty millions* in gold," or say $80,000 per mile.

It must be clear to any thinking man that the whole object of Mr. Huntington and his associates is to be let alone in charging the people exorbitant rates to provide means to build new lines that will be without restriction as to charges; when they will erect new toll gates, through which the traffic of the country tributary to such new lines must pass, subject to such conditions and charges as will most quickly fill their own private purses, without regard to the rights of a suffering people or an outraged Government.

All that the Texas & Pacific Railway Company ask is, that the people and Congress shall give this subject a fair investigation, and if they shall be satisfied that the public interest will be promoted by the construction of another transcontinental railway, under proper restrictions as to its use by the public, that they will give it their honest support, without heed of that public clamor raised by interested parties, who will make all possible misrepresentations of facts to promote, or rather to preserve, their own private interests, no matter at what cost to the Government and the people.

FRANK S. BOND,
Vice-President Texas & Pacific Railway Co.

"From Atlantic to Pacific."

WASHINGTON CITY, D. C., Dec. 31, 1875.

TO THE EDITOR OF THE RAILROAD GAZETTE:

As the only representative now on the Atlantic coast appointed by the Governor of California to attend to the interests of that State at the late great National Railroad Convention, held at the city of St. Louis, Nov. 23 and 24, you will, I trust, grant me space to reply, as briefly as the subject permits, to

the somewhat *extraordinary* explanation relative to the Texas Pacific given by the Vice-President of the Central Pacific of California, or the "Agent and Attorney Southern Pacific Railroad Company," which latter title Mr. Huntington has chosen to assume for the emergency.

In the first place, the paramount interests of a railroad really *Southern* in character, calculated to restore to the States west of the Mississippi a renewed activity of commercial prosperity, will not permit of an entanglement of combination with that branch of the Central Pacific of California commonly known as the Southern Pacific. Indeed, clothed as has been this abortion of the California Central in this delusive title, its very name has become a source of danger to the real enterprise.

Under the former General W. S. Rosecrans' management, the Southern Pacific of California, as originally chartered, aimed to construct a railroad from San Francisco through the southern coast counties to the bay of San Diego, there to connect with a line over the 32d parallel of latitude from the Mississippi. But, when the control of that organization fell into the clutches of the leading proprietors of the Central Pacific, to the mission of the Southern Pacific was charged a subservient compliance to the interests of the former, and being now one of its feeders or extensions, commencing *nowhere* and ending *nowhere*, yet always held in convenient readiness to contest the ground with any railway enterprise which promised or promises to be extended to California *via* the southern portion of the State.

At the time when the Atlantic & Pacific Railroad Company gave promise to extend its line from Vinita to the Pacific, the Southern Pacific of California at once secured concessions to meet that line from the east at Fort Mohave or the Needles in the territory of Arizona; and since it has become apparent that the Texas Pacific according to its requirements by an act of Congress would build to San Diego, the only harbor worthy of the name between the Mexican States and San Francisco—and distant from the latter 500 miles—and a port whose geographical position in connection with the trade of the Orient and India has always been a source of considerable vexation to the Central Pacific, the latter hastily determined upon preventing the extension of the Texas Pacific to San Diego. Under the plea that their system of roads would shortly stretch to the River Colorado about two hundred miles from San Diego, Mr. Huntington appeared before the Committee on Pacific Railways of the House and Senate, and stoutly insisted upon a combination of interests with the Texas Pacific.

Having carefully investigated the issues involved, the committees *unanimously* decided to reject the proposition advanced by Mr. Huntington, and a bill was favorably reported to Congress which promises an unbroken line of railway from Shreveport, Louisiana, to San Diego in the State of California—it being framed entirely in the interest of competition and the people.

It is generally conceded that had it not been owing to the fact that the session was then drawing to a rapid close, the bill as recommended would now be law, and the country would witness a new era of great commercial and industrial developments.

The attempt to stigmatize the Texas Pacific bill a "subsidy proposition" is entirely devoid of truth and so reported in the interest of existing and designing monopolies.

The bill as again submitted to Congress asks Government to guarantee the payment of the interest (not the principal, as is the case with the Union and Central Pacific) at the rate of five per cent. per annum on fifty-years construction bonds to be issued by the company to the amount of $40,000 per mile.

To protect Government, however, against any possible losses, the following safeguards are embraced:

"The entire issue to be deposited with the Treasurer of the United States and secured by a first-mortgage to the Government covering the entire property and franchises of the companies, including, in the case of the Texas Pacific road, about 15,000,000 acres of land, heretofore granted by the United States to aid its construction. These bonds are to be delivered as the road is constructed, in the plain country at the rate of $30,000 per mile, and in the mountain country $40,000 per mile, but—by a stipulation in the bill—not to exceed $35,000 per mile for the whole line. The bill further provides that these amounts shall in no event be issued unless actually required to properly construct and equip the road, which must be shown by the certificates of Government Inspectors appointed by the President of the United States, certifying that the actual cash expenditures exceed in amount the value of the endorsed bonds to be delivered. The remaining bonds ($5,000 per mile) are to be retained by the Government for sale and use in paying accruing interest on the bonds issued, in case the proceeds of sales of lands, the receipts for transportation of troops and military stores and Indian supplies, and for postal and telegraph service for the Government, and the entire net revenues of the road from other sources shall not equal the coin interest charge of (on an average) $1,750 per mile on completed road. In addition to the retention by the Treasury of all amounts earned for Government transportation and the obligation imposed on the companies to turn over to the Government sufficient amounts from their earnings to provide beforehand for the interest payments, they are also required to pay into the Treasury one per cent. per annum until the year 1900, and two per cent. yearly thereafter on the entire amount of their bonds, to create a sinking fund for the payment of the principal."

I am aware that a subsidized press has continually misrepresented these conditions, but the people are gradually having their eyes opened. In California the present condition of railroad affairs is simply alarming. The Central Pacific Company, with the exception of ten miles of road owned by the Texas Pacific from San Diego, eastward, and twelve miles of constructed railroad from Santa Monica to Los Angeles, controlled by Senator Jones, of Nevada, monopolize every inch of railroad to and from every avenue of ingress to the State; besides, they have, or are attempting to possess themselves of, every available mountain pass to the East, thereby effectually guarding against competition and opposition to their existing monopoly. Indeed, in the explanations made by Mr. Huntington I have been somewhat amused at the following unguarded remarks: "The Southern Pacific, like the Central Pacific Company, have hitherto regarded their field of operations as belonging exclusively to the Pacific water-shed of the Continent, and have *resolutely abstained* from participation in any roads in the Mississippi Valley or eastern connections!" Perhaps Mr. Huntington's connection with the Chesapeake & Ohio, as well as the Lexington road—both in the hands of a receiver—has proven of so unprofitable a character that he should be pardoned for endeavoring to ignore his operations this side of California.

Upon every occasion when the question of the Texas Pacific is agitated Mr. Huntington takes positive pains to inform us that the Southern Pacific of California is a distinct organization, and independent of the Central Pacific; yet with rare frankness this gentleman tells us that "some of the more important shareholders in the Southern Pacific are at present also shareholders in the Central Pacific; the solution of which is discovered in the apparent confidence reposed in Mr. Huntington, who as Vice-President of the Central Pacific appears this side of the Atlantic as the agent and attorney of the Southern Pacific Railroad; but in reality, if his directory at No. 7 and 9 Nassau street can be relied upon as correct, then Mr. Huntington is the President of the Southern Pacific as well.

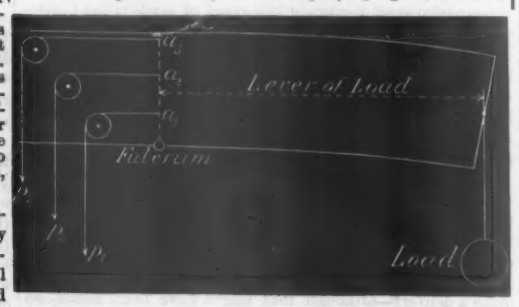
The truth of the matter is, the Southern Pacific extensions of the Central Pacific secure the perpetuity of the present monopoly, and should that grasping organization succeed in its selfish designs, the subjugation of this great Southern railway enterprise in the hands of its enemies would shortly bring about the same state of affairs now existing in regard to the Pacific Mail. Last winter, while the Texas Pacific bill was pending before Congress, Mr. Stanford, President of the Central Pacific, appeared before a San Francisco Chamber of Commerce and informed his attentive listeners that just as long as there existed the Pacific Mail Company, San Francisco and California would always have the benefit of competition, yet while making this declaration the Central and Union Pacific had the controlling interest of the Pacific Mail carefully stored away in their safes. Mr. Huntington now informs us that the Southern Pacific Company is prepared to take the land grant donated to the Texas Pacific by Government and build us a Southern line. Will this assertion and shallow pretence throw the people of the country off their guard? It is easy to perceive that a non-compliance with the terms of the charter would forfeit the land grant, and with this would end the dreams of a real Southern Pacific Railroad. If, with the prestige, reputation and confidence enjoyed by Colonel Scott and his associates, these parties under the existing depressed condition of financial affairs are failing to secure a favorable loan upon their enterprise, whereon they have already, out of their own private fortune, expended ten millions of dollars, I am very loath to believe that any California railroad magnates will share a better fate, unless, indeed, it is proposed to extort the money required for its construction out of the pockets of the people of California, which is readily effected by an additional advance in fares and freights; and which, if carried into execution, would forever prevent a healthy system of competition. Indeed, so far as the Texas Pacific is concerned, it is to the opening up of this thoroughfare that our commercial cities and the States of the Union will be forced to turn, in order to secure, or even maintain, a portion of the Oriental, Australian and India trade; as, by the Texas & Pacific road, 1,500 miles of water and land transportation can be saved. With the Suez Canal now under complete control of the English authorities, and the present high and combined rates ruling between the Pacific Mail and the Union and Central monopolies, it requires no prophet to tell us that we will rapidly lose a trade for which nations have always been contending; hence our self-preservation demands immediate action favorable to the construction of the Texas Pacific.

DAVID FELSENHELD,
Member of the Committee of 13 appointed by the St. Louis National Railroad Convention.

Sketch of the History of the Theory of Elasticity and of its Application to Bridge Building.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The immortal Galileo in his dialogues (1638) published his investigations on the strength of materials, to which his mind became attached on occasion of a visit to the arsenal of Venice. Galileo supposed solid bodies to consist of inextensible parallel fibres, and explained flexure of beams as taking place around fulcrum lines situated in their upper or lower surfaces. The action under flexure by this supposition would be the same as the one represented by the accompanying figure, in which



the forces p 1, p 2, p 3, acting on levers oa 1, oa 2, oa 3, are counteracted by the load working on its lever. The fibres of this body being inextensible, their total action would be proportional to the cross section of the beam multiplied by one-half of its height.

This hypothesis is known to be incorrect, but was sufficient to lead Galileo to estimate the strength of a beam as being proportional to the breadth and to the square of its height. He also derived therefrom the law that a cantilever beam of uniform strength and loaded at its extremity and hence of least material should have variable depths so that its elevation appears in the shape of a parabola.

From this notion Galileo further deduced that indeed nature builds every tree, every grass, every feather and bone according to this law of least quantity of material for the purpose. Finally he argued that the elliptic section of hollow bones is actually the strongest form in which they can be built with the same amount of material.

Galileo made no experiments, and he erred when he concluded that a beam for a uniformly-distributed load of uniform strength and equal width, when resting on two supports, must be designed in the shape of two parabolas joining in the center of the beam. This would only be true for a concentrated load in the center.

The Frenchman, Blondel, followed up these researches, and proved that uniformly-loaded beams must be shaped to follow the curve of an ellipsis. This was about the year 1657, when he communicated with the Swede, Wurtrius, who seems to have been the first experimenter on the strength of beams.

Galileo's pupils, Grandi, Marchetti and Viviani, continued his researches; but the first great step after him was made by Mariotte about the year 1680. Experiments with pipes led him to the conviction that Galileo's theory could not be correct, and that his formula must be altered. He arrived at the conclusion that the materials must be considered extensible and elastic, while Galileo had taken the fibers as inextensible.

According to this notion, still supposing the fulcrum of flexure of a rectangular beam in its upper or lower surface, its strength must be considered proportional to one-third of the square of the height. This result was obtained by Leibnitz, who developed Mariotte's notion. Leibnitz had noticed the deflection which occurs with any beam, and thereby found Mariotte's hypothesis to be corroborated. According to Leibnitz, the extension and the strain of a fiber are the greater the farther its distance from the fulcrum, which he still supposed in the lower surface of the beam. The notion that the extensions of fibers under flexure are proportional to their elastic strains originated with Mariotte and Leibnitz.

English writers usually ascribe it to their countryman Hooke, who in the year 1766 had published the result of his experiments on the action of coiled watch springs in the anagram, *ut tensio sic vis*.

The very intricate nature of the strains of these springs undoubtedly was unknown to Hooke at that time, as it was to everybody else; nor did he measure any extensions; and if he had done so he would have spoken of extension, but not of tension. What he meant, probably, was that the degree of winding up of these springs is proportional to their initial force. At that time the axiom was not yet understood that mechanical effect is equal to its causing force, and it is rather probable that it was this law that Hooke found true in the special instance of a watch spring. Indeed, this law generally was first expressed by the French philosopher Varignon, who in the same year, 1687, independent of Newton, discovered the law of the parallelogram of forces and motions.

Therefore we cannot but give Mariotte credit for having first conceived the law that the extensions of fibres are proportional to their strains.

Mariotte was a member of the Academy of Sciences in Paris, and discoverer of the similar law with reference to elastic fluids (air), and also made interesting experiments on impact of elastic (ivory) balls, well-known to everybody from school lectures on natural philosophy.

Mariotte, finally, was the discoverer of the law that a beam resting on two supports, but fixed rigidly at the ends *(encastre)*, can stand twice as much as if it were freely supported at the ends.

James Bernouilli seems to have been the first experimenter on the extension of strings. Using twisted strings, his results did not fully agree with Leibnitz's mathematical results.

But he made the next important step in the theory of flexure, namely, that of considering the compressibility of fibers in combination with extension. Thus he was led to the discovery of the neutral axis within a bent beam, and therefore brought the problem of transverse strength into that shape in which it is given in our text books.

Already in the years 1694 and 1695 Bernouilli *(Acta Lipsiæ)* had treated the elastic curve, but did not succeed in his efforts, so that this very interesting problem remained to be solved by that master in analysis, his countryman Euler, of Basel, who in the year 1747, being member of the Academy of Berlin under the reign of Frederick the Great, completely overcame the difficulties. (Euler: *De Curvis Elasticis.*)

Thus Leonard Euler gave us the theory of the elastic curve and of flexure in precisely the form in which it is represented in text-books, and later was used by the great French engineer, Navier.

Just as in all other branches of science, it is not to a single man that can be given all the honor of having brought forward this new science of elasticity, but a great number of learned men of various nations at the same time occupied themselves with the same question, and step by step the problem was developed and brought to greater perfection.

Numerous experiments were made to test the deductions of preceding mathematicians, new conclusions were drawn from those already made, and the immense advantages gained in the exact sciences by the differential calculus, prepared by Huyghens and worked out by Leibnitz and Newton and by the integral calculus, invented by Bernouilli, aided the inductive method to an extent which can hardly be over-estimated.

Of course it was but natural that the inductive as well as the deductive methods should be abused, but criticism followed so quickly that errors made by experimenters were soon detected by mathematicians, and analyses founded on unsound suppositions were corrected by searching experimenters.

Among the savants who devoted much time to experiments were Buffon in France (1740 and 1741), who determined the coefficient of elasticity of many substances; Belidor, also in France, who experimented on the crushing strength of stones; Mushenbrock, of Leyden, in Holland, (1729), who tested ex-

pecially the compressive strength of very long pillars, which he found to decrease as the squares of their heights increase.

The famous Euler had proposed to himself to solve the problem of bodies crippling under pressure, and mastered this problem theoretically as far as it is at all possible. His formulæ, being based upon perfect elasticity, could only be correct within the elastic limit, or for such pressures under which the permanent sets form only so very small a part of the elastic deformation that they can be neglected in theory as well as in practice.

Only under this fundamental limitation are any of our formulæ correct, and as soon as the permanent sets form an appreciable portion of the total deformation, no part of the theory of elasticity can any longer be applicable.

Euler's valuable investigations on the compressive strength of long pillars made part of his studies on elastic curves, and were first published in the *Annales de l'Academie* of Berlin in the year 1757. Euler treated the elastic curves under the supposition that, the deformations being small, the projections of these curves can be considered as equal to their actual lengths. The same supposition in this century was made by Navier towards simplification of the catenary, which under this supposition can be treated as a parabola.

In Euler's investigations on the crippling strength of columns, compression and flexure were combined, and he arrived at the rule that the strength decreases as the square of the length increases, which rule Mushenbrock had found to be correct for very long pillars. For short, and for thin hollow pillars, Euler's expression is not more correct, which Mushenbrock, by later experiments, soon discovered. Indeed, this exception must be expected, so much depends on the uniformity of material, on its hardness, on the originally more or less perfect form of pillars, further on workmanship, detail connections, or the mode of bringing the directions of pressures more or less near the center line of gravity of a pillar, on friction upon the supporting surfaces, on the nature of the bearing surfaces, &c. &c.

Euler investigated another problem of the greatest difficulty, namely, the pressures imposed by a load on four supporters of a plate.

This is one of the highest problems of analysis, including the theory of continuous girders.

The famous French mathematician, Lagrange, followed Euler, and arrived at the same expression for compressive resistance of long columns.

The number of experimenters increased towards the end of the last century and in the beginning of the present one. Experiments on the ultimate tensile resistance of wood, iron and steel, on ultimate extensions, on the contraction of areas, on the coefficient of extensibility (moduli), on flexure and torsion, were executed and compared by engineers, natural philosophers, and architects of all civilized nations.

Thus we find the principles of the theory of elasticity ready to be applied in practice before a single wooden or iron truss bridge had been built, so that it must be evident that without this knowledge sought and found by those learned men the high state in which the practice of construction is found to-day could not possibly have been attained.

One very important part was left to be done in this century; namely, that of bringing the new science from the collections of academies of science into technical school-rooms.

In this regard the engineering profession is deeply indebted to the famous Navier, who in his celebrated works on the elasticity of solid bodies, and in his memoir on suspension bridges, brought the theory of elasticity into that elegant form and presented it with that clearness for which the French language seems particularly well adapted.

That part of the theory which was known in Navier's time constitutes what may be called the elements of the new science. In these it is supposed that all bodies, according to Galileo's idea, are composed of parallel fibers. Navier, on the contrary, was the first mathematician who considered material homogeneous in all directions, such as well-hammered wrought iron or good cast steel. He by means of analysis examined the reduction of area of a bar when subjected to tension or pressure, and arrived at the conclusion that in case of tension there exists a lateral compression one-quarter of the value of the tension, and *vice versa*, there exists an equal amount of lateral tension with bars under compression.

Navier also examined torsion, and found the torsional or shearing modulus to be 4-10 of that for direct strain. He likewise proved that each shearing strain is combined with tensional and compressional strains, whose maximum values are found in lines making 45 degrees with the shearing strain. These maxima Navier found to be 1¼ times as large as the shearing strain itself, so that, indeed, a shearing strain equal to 8,000 pounds per square inch would be accompanied with tensile and compressional strains of 10,000 pounds per square inch.

The famous French mathematicians, Poisson and Cauchy, and the German Professor Dienger arrived at the same theoretical result, which was experimentally examined by Regnauld and by Wertheim. Their experiments, however, seemed to show that the factor ¼ is not perfectly correct, but that ⅓ to 1-3.6 would rather answer the reality.

Probably the substances on which they experimented were not perfectly homogeneous in all directions, for these were rolled or drawn, as iron in pipes or perhaps unequally cooled as in glass.

According to theory, the modulus of shearing strains is equal to 400-1000 of the modulus of direct strains, while Wertheim found for sheet iron on the average 393-1000, which seems, however, as nearly equal the theoretical result as can be expected.

Cornu, in France, by the use of the laws of optics, has examined the coefficients with glass prisms under flexure, and found on the average the theoretical quotient ¼. These results agree, we may say, sufficiently with the complete facts and conclusions given us by one of the most reliable practical experimenters, namely, Woehler, of Berlin, who, after experiments on the life of iron and steel, found the durability under tensile strains correspond with that of shearing strains of only 8-10 of the value of the tensile strains.

For Krupp's steel, Woehler found the shearing modulus equal to 390-1000 of that for direct elasticity, which result deviates only 1 per cent. from Navier's theory. These results indeed, are sufficient to give confidence in the *correct* application of the laws of elasticity found by the great natural philosophers of the last and of the present century.

What else had been done in science previous to the commencement of iron truss and bridge-building consisted of simplifications of the old formulæ, in which respect Clapeyron in France must be named.

Further, the Frenchmen, Lame and St. Venant, have scientifically continued the labors of Navier, and especially have examined flexure and torsion under the consideration of shearing strains and of lateral contraction and expansion. The late German Professor Clebsch has continued their labors.

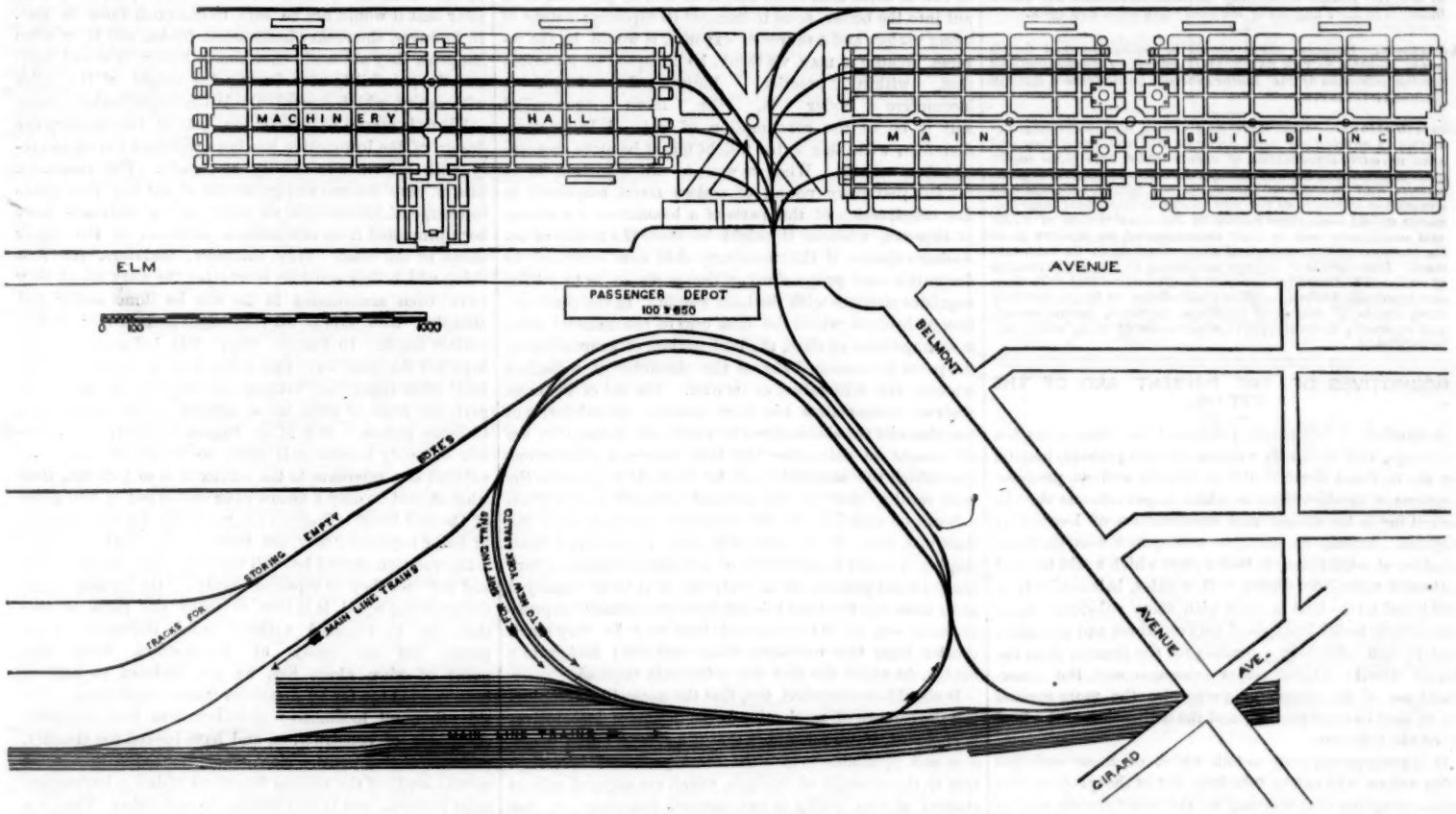
The determination of the strains acting in skeleton trusses is based only on the very first principles of statics, and was a very easy task for the well-trained mathematical minds of our days. In this regard, Mr. Whipple in this country, Culmann, Schwedler and Ritter, in Germany, can be said to have exhausted this subject.

Finally, it must be mentioned, that Professor Culmann, of Zurich, using the polygon of forces advanced by Varignon and used by Poncelet, in France, built up a perfectly new branch of engineering science by treating the problems of statics graphically. Similar steps in this direction had been made by Maxwell and Rankine in England, and by Mohr, in Germany. Culmann's work on graphical statics constituted an epoch in this new direction; his lectures attracted the admiration of his scholars, and his deductions were worked over and partly extended by others.

As far as direct experiments on the practical value of materials are concerned, the labors of Barlow, Fairbairn, Hodgkinson, Brunel, Kirkaldy, in England; Duleau, Bornet, Love, Morin, Brix, Lagerhjelm, Karmarsch, Gerstner, Eytelwein, Styffe, Sandberg, and others, in France, in Germany, America, Sweden, etc., partly made by individuals, partly under direction of governments, completed, corrected and multiplied the results and figures obtained by previous experimenters.

Recently most valuable progress has been made in the manner of carrying on experiments and in their proper arrangement to answer the demands of practice. In this respect, Woehler stands first, and next to him Bauschinger, of Munich. Professor Bauschinger's experiments on low and high steel will form the subject of a further communication.

C. BENDER.



PLAN OF TRACKS AT THE CENTENNIAL BUILDINGS.

The Railroad Tracks at the Centennial Grounds.

The accompanying engraving exhibits the arrangement of the tracks constructed at the Centennial Grounds by the Pennsylvania Railroad Company, under the direction of the Engineer of Maintenance of Way, Mr. William H. Brown. The proposed method of using them is as follows: All the passenger trains from Jersey City, Trenton, Philadelphia and Baltimore, as well as from the main line, will enter the station from the south end and unload their passengers as soon as they are clear of the switches. After the trains are unloaded, they will pull around the circle, taking the right-hand track, and backing into the siding, where they will remain until it is time for them to depart.

When these trains are to be loaded again, they will draw around the curve and enter the passenger station from the south end, as before, receive their passengers, and take the left-hand circular track, passing under Belmont avenue bridge on No. 2 track, keeping entirely out of the freight yard until they reach Mantua Junction, or West Philadelphia. Trains intended for points on the main line will be loaded in a like manner, but in departing from the passenger station they will use the track marked for that purpose. One of the advantages of this plan is that the trains all run in the same direction, which, if properly managed, will render "butting collisions" impossible.

It is intended to have the depot for departing trains fenced in such a way as to prevent passengers, either from accident or design, getting on the wrong train.

—Mr. Henry Seyfert, head of the widely-known iron firm of Seyfert, McManus & Co., of Reading, Pa., died in that city Dec. 23.

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Editorial Announcements.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

LOCOMOTIVES OF THE PRESENT AND OF THE FUTURE.

A number of editorials, published in *Engineering* ten years ago, and evidently written, though perhaps hastily, by the brilliant Zerah Colburn, contain various prognostications of the directions in which improvements may be looked for in the design and construction of locomotive engines. Among the changes anticipated were the manufacture of solid rings of boiler plate which could be used without longitudinal seams, hollow axles, balanced valves, cushioned tires—that is, tires with some substance more elastic than metal interposed between them and the wheel centers, and affording a bearing for the former, as in the Griggs wheel; higher steam pressures and the consequent use of the compound principle, the more general use of steel in construction, and the utilization of the load to create adhesion.

It is perhaps too early to tell which of these anticipations will or will not be fulfilled; but at the present time none, excepting that relating to the more general use of steel, have been fulfilled, and even of that there are many who still doubt whether the prophecy is a true one. Solid boiler rings have, so far as we know, never gone beyond the experimental stage. Hollow axles are in the same category, and all we hear of them is that "a company" has for a number of years been working a patent which apparently would do everything excepting make axles. Balanced valves have been like the scribes and Pharisees who, if without fault, were to cast the first stone: "they went out one by one, beginning at the eldest, even unto the last." Cushioned tires are no more extensively used to-day than they were when Colburn wrote. The increase of steam pressure has been very slight, if any, from 120 to 130 being the maximum in this country. The application of the compound principle to locomotives, although the subject of several patents, has not, we believe been put into actual use, and the utilization of the load to create adhesion has not been thought of for a long time, as locomotive engineers have learned that, excepting for engines to run at exceptionally low rates of speed, the weight of the boiler and the machinery will afford as much adhesion as it is possible to supply steam for.

The question naturally occurs then, in what direction has there been any improvement in locomotives, or has there been none in the past ten years? Considering that the cost of running and maintaining locomotives is about 20 per cent. of the whole expense of operating railroads, and that their efficiency has a direct influence on nearly all the train expenses, it must be regretted that there has been so little improvement, that locomotive engineers have been so barren of invention and so indifferent to all reform. Since the adoption of the link-motion—if we except perhaps the use of injectors, the value of which is only now beginning to receive tardy recognition in this country—"there has been no improvement in those features of plan and construction which involve broad principles of science or even of the science of mechanics." An improvement, it is true, has been steadily going on in the design and construction of the details; better proportions and more convenient arrangements have been adopted; but generally these improvements have reference only to the convenience of handling, either in working or repairing the engine, to the appearance or to the cost of manufacture. As it is so happily expressed in the quotation above, in "the science of mechanics" there are very few indications of any improvements which are the result of deductions either from a high order of purely theoretical or from empirical investigations. The details of locomotives are made "about so," because they have always been made that way, and "have given no trouble;" or are made "a little heavier," because at some time they have been found to be too weak.

It would be very interesting and profitable to know what the cost is of carrying each additional ton of dead weight on a locomotive. That is, suppose a ton of pig-iron to be loaded on the foot-board of an engine, what will be the whole additional cost incurred in running 100 miles? What if two tons were added; three, etc.? We are inclined to believe it would be less than is sometimes supposed. On the other hand, suppose that instead of putting the ton, or two or three tons extra weight in useless pig-iron, it is put into the boiler, so as to increase its capacity; instead of being useless and a source of expense, it would be the reverse, because it may, we think, be accepted as an axiom that, within practical limits, the larger a locomotive boiler is, the more economical will it be in the consumption of fuel. A locomotive, therefore, with this extra weight might be more economical than without. What we want to call attention to is the fact that every pound of useless metal employed in the construction of the parts of a locomotive is a source of expense, whereas it might be made the means of reducing expense, if the necessary skill were exercised in designing and proportioning the parts so as to get the requisite strength with the least weight. In the construction of bridges, where the first cost of the material alone is so important an item, the best method of proportioning the parts has assumed almost the character of a distinct science, with a literature of its own. The aid of the most abstruse mathematics has been invoked, the subtleties of calculus and the abstractions of graphical delineation are all sought to determine the best form and proportions into which the materials can be wrought to produce the best results—that is, the greatest strength with a given amount of material, or the requisite strength with the least material. It is quite true that the material itself employed in the construction of a locomotive forms a very insignificant portion of its cost; but if it be so employed as to make the machine less efficient, the ultimate expense growing out of the continued loss may be very much greater than that resulting from unskillful design in a bridge, in which the first cost is the only expense.

It should be remarked, too, that the necessity of employing the science of mechanics in the design of locomotives is apparent, if we remember that it has been found necessary and profitable to give the most profound investigation to the strength of bridges, which are exposed only to statical strains acting in one general direction. If this problem requires the exercise of such profound investigations, the dynamic and thermic strains which act on the parts of a locomotive must present very much greater difficulties, and therefore make it a field for the exercise of the very highest order of theoretical mechanics. The usual plea is that a little extra iron costs only a few cents a pound, and it is therefore best to err in the construction of locomotives on the safe side, because if it is too strong no one will ever find it out. This may all be quite true, but when the machine is finished it will be what might be called a reproductive source of expense. Some years ago a number of locomotives were built for a Western road, of which the complaint was made that they had not adhesion enough. To remedy this the builders, in constructing the next lot for the same road, put a cast-iron foot-board weighing several tons on the back end of the frame. The result very naturally was that the engines then could not make steam enough to utilize this extra adhesion. The cost of the additional pig iron put into the foot-board was comparatively trifling, but the railroad company has doubtless since then paid at least a thousand-fold its first cost, through the diminished efficiency and economy of the engines.

Take, for example, so simple a problem, comparatively, as the proportions of a main connecting-rod of a locomotive. Whether it should be heaviest at the centre or at the back end seems yet to be a disputed point, and the relative proportions of its parts is a subject apparently too refined for consideration. The only reason we ever heard assigned for the pracice of making them heavier at the back end than elsewhere was given by a master mechanic who said that he had observed that about nine out of ten which were broken were fractured at the back end.

We do not mean to say that all the proportions of all the parts of a locomotive can be determined by theoretical deductions—probably, very few of them can with certainty—but there can be no doubt that such investigations would indicate how the former may be improved. One of the evils of making things too heavy is that *it never is found out.* The pound or the ton of useless metal is not only carried backward and forward for years and over thousands of miles of road, but like other errors and evils, reproduces itself in new engines. Now the province of science is to find out what is useless. The weak places may safely be left to practical experience for discovery, but the *dead* weight must be eliminated by scientific research.

In making these suggestions, we do not wish to undervalue the teachings of experience in indicating points of weakness. The first duty of a locomotive is *not* to break down, and if it have not that virtue all the rest is nought. We know of a superintendent of machinery of one road who is keeping a record of all the breakages of parts of locomotives, with sketches of the broken parts when needed. The practice cannot be too highly commended. If to the report could be added photographs of the broken parts, it would have very great value; but while such records would teach us how to make things sufficiently strong they ought at the same time to furnish a sort of negative guide to enable us to reduce unnecessary weight with safety. If, as an example, it were found that rocker shafts 2¾ in. in diameter broke occasionally, it would be very clear that it would not be safe to diminish them in size. If, however, the rocker boxes never broke, and if, as often happens, they are made enormously heavy, it would indicate the possibility of reducing the weight of the latter with safety, which careful calculation might make certain.

There is reason to believe, too, that in this country the design of the locomotive has been regarded too exclusively with reference to facility of repairs. The reason for this is very natural and grows out of the fact that those in charge of locomotives on most of our railroads have been promoted from subordinate positions in the repair shops of the road. Very naturally, therefore, the first thing which they consider is whether the work which they have been accustomed to do can be done easily and cheaply. Now, this is all very right and proper within certain limits. In Europe, where this influence has perhaps not the same force that it has has here, engines are built often apparently without any reference to ease of repair, and some of them are as difficult to take apart as a Chinese puzzle. But if an engine is built in a certain way only because it is easier to repair in that way, without any reference to the service it is to perform, then what should be only a means to an end is put in the place of the end itself. Engines are not built for the purpose of being repaired; they are built to do work, and the main question should be, will they do their work easily, and not can they be repaired easily? Of course, other things being equal, it is best to make the parts so that they can be repaired without much difficulty or expense; but the study of locomotives from this point of view alone has, we are inclined to believe, been carried too far by American master mechanics. Besides this, all locomotive manufacturers have regarded cheapness of construction, and have looked too steadily, perhaps, at that point. Now, what is needed is a more careful study of the various functions which a locomotive must perform, and their relations to each other. This is a more complicated and difficult question than appears at first sight. A locomotive consists of an organ, that is, the boiler, which produces power in the form of steam, other organs which use power, or the cylinders and their appendages, and another which applies the power, or the wheels and running gear. Now, in designing a locomotive the advice of Ruskin about reading books, should be kept in mind. The advice was, to remember that if we read *this*, we can't read *that*. So of a locomotive: if we put the weight *here*, we can't put it *there*; or if we give the space to *this*, we can't give it to *that*. The thing to do is to devote the space and the material to that which will produce the maximum results. If we make large and heavy wheels and cylinders, we must make a light boiler. The question is, then, where will the weight and material give the best results? What is the value of a large grate surface compared with a large diameter of boiler? How much more efficient would a locomotive be if the furnace were widened out the full width between the driving-wheel flanges? How much cylinder capacity should there be for a given amount of adhesive weight and size of wheel? What should be the proportion of the grate to heating surface and of the latter to the weight and speed of the engine? All of these questions involve considerations not of fancy but of the relation of the vital functions of the machine; and yet we believe that they frequently receive less consideration than is given to the means provided for removing a piston or taking out a pair of driving wheels. Engines are built with big driving-wheels because they look well, when the person ordering them has perhaps never given a thought to the relations which exist between their size and the other parts of the engine. A different arrangement of springs would make it possible to widen the fire-boxes of nearly all American engines about six inches, or over 15

per cent., thus increasing the capacity of the very vitals of the engine in that proportion, and yet this is never done here (excepting on the Boston & Albany Railroad), because it makes it more inconvenient to repair or take down the springs. Now it is not said that the common practice is not the best, but it should be adopted only after the most careful consideration of the value of that much additional room in the fire-box and in the grates, and we doubt whether such consideration is ever given to it.

It is, of course, impossible for any person, unless he be a prophet, to anticipate the inventions which will be made in the future to improve locomotives. An entirely new departure may be at hand; but at present it is not apparent. The indications are that the improvements will be simply in the proportions of the parts and organs, and that this will or can be brought about by careful study and the application of scientific investigation to the design of the parts of these machines.

THE ERIE REPORT.

We publish elsewhere an imperfect summary of the report of the Erie Railway Company for the year ending with September, 1875, which has this week been returned to the State Engineer and Surveyor. This report is made to comply with the form required by the New York statutes, which is imperfect in many particulars. The company, however, has made several specifications where only general statements are called for, and there is much information given not usually contained in reports to stockholders, much of which were introduced last year, when apparently the first serious attempt was made to have the report accurate.

Our summary gives the funded debt in a lump. The official report adds in a foot note a detailed statement of the different issues of bonds, with the dates at which they mature. This list agrees with that published in Mr. Jewett's statement to the shareholders of May 13 last, except that the amount of the convertible sterling loan was then given as $4,580,000, and is now reported as $4,457,714. There is the additional information, never published before, we believe, that $71,000 of first-mortgage bonds bear 7½ per cent. gold interest (the rest 7 per cent. currency); and the statement of last year, reducing the average interest to currency, at the rates of premium for gold and of sterling exchange actually paid, is repeated, thus making the burden of interest charge intelligible at a glance. This average currency interest was 7.64 per cent. for 1874–75, against 7.36 per cent. the previous year. The funded debt appears increased by the last report, but the amount added was already negotiated at the date of the 1874 report.

The report makes plain that the company's default last July was not primarily due to a decrease of earnings, but chiefly to the increase of burdens. The traffic has fallen off, and so have the earnings, gross and net; but after all only slightly. It is the growing bulk of interest charges unaccompanied by an increase of profits that has wrecked the company. The falling-off of traffic has been but 3 per cent., and just about the same in freight and passengers, and the decrease in gross earnings was but 5 per cent. But this has been attended by a decrease of 6½ per cent. in working expenses, which gives a reduction of $884,600 in expenses to set against a reduction of $921,150 in receipts, so that the decrease in net earnings has been only $36,500 —hardly appreciable in comparison with the whole amount.

About three-fifths of the decrease in gross earnings is due to the decrease in traffic, and two-fifths to the decrease in rates. Most of it—$1,450,000—was in freight, and a million dollars of this loss could have been saved if the average rates of the preceding year—itself remarkable for low rates—could have been maintained. The test of economy in working, and the criterion for comparison with receipts and profits in previous years and on other lines, are to be found in the earnings and expenses per unit of traffic, which we have calculated, and present below.

The receipts, expenses and profit per ton and per passenger per mile, in cents, were:

		Receipt.	Expense.	Profit.
Passengers.	1875	2.227	1.951	0.276
	1874	2.313	2.001	0.312
Freight....	1875	1.209	0.949	0.260
	1874	1.312	0.913	0.399

Here we see a reduction all around, but the reduction in receipts is so much greater than the reduction in expenses as to bring down the profit considerably—12 per cent. on passengers and no less than 35 per cent. on freight, This is a process which did not begin last year, however, as a comparison with the figures from that year with those of 1872–73 will show:

		Receipt.	Expense.	Profit.
Passenger...	1875	2.227	1.951	0.276
	1873	2.218	1.933	0.285
Freight	1875	1.209	0.949	0.260
	1873	1.454	1.036	0.418

With freight rates equal to those only two years before, therefore the profit per ton per mile would have been 0.245 cents greater last year, and the net earnings would have profited by this to the amount of $2,500,000. A decrease in the average rates received, however, has always been probable, though one so rapid and so great could hardly have been expected. It was to prepare for this that the company needed large expenditures for improvements.

Considering the condition of the road—that is, its lack of double track and terminal facilities, and its exceptional gauge—it has certainly been worked very cheaply. In 1873–74, the New York Central, with all its advantages, expended 0.85 cents per ton mile, against the Erie's 0.95 this year; but it makes a much better showing on passenger traffic. The Pennsylvania Railroad in 1874 carried at an expense of 0.71 per ton per mile, and the difference between this and the Erie's rate of expense would amount on the latter's traffic last year to $2,400,000, and at the Pennsylvania's rate of expense on passengers it could have saved $600,000 on this branch of traffic also, with no more business than it had last year. But with the means now at command, the road has been cheaply worked. The reduction in expenses appears to be partly due to the better average freight-train load. The entire work, passenger and freight, was done with a reduction of 4 per cent. in train mileage, the traffic having fallen off but 3 per cent.

A consideration of the working expenses in detail would be worth attention, but we cannot give it this week. We will only say that there is a saving of about $450,000 in maintenance of road-bed and track (an increase for rails), an increase of $220,000 for repairs of bridges and buildings (which includes the replacing of several burned structures in more durable material), and a decrease of $352,000 in maintenence of equipment.

The total expenses of the year, including interest, etc., are given as $1,353,000 more than the income. An increase of $920,000 in the cost or road and equipment makes this less unfavorable than it appears.

Some Comparisons Between American and Foreign Railroads.

Last week we presented an analysis of the report of the German Railroad Union for the year 1873, which gives a view of the condition and cost of the German and Austrian railroad system and an account of its operations for the year in question. Some months ago we compared the American and British roads. With the information now at hand we propose here to make some comparisons of British and German railroads with those of the United States as a whole, so far as we have collected statistics for the latter, and in some particulars of the workings with the railroads of some of separate States.

For the country as a whole, we have to depend on the last issue of Poor's Manual, in which the reports are for the last fiscal year of each railroad for which a report had been published previous to May last; for Great Britain the Board of Trade Report for 1874 furnishes the figures; for Germany, Austria and Hungary (all included under the head of "German"), the report of the German Railroad Union for the year 1873.

For these we have the capital invested (stock and debts), earnings, expenses and profits per mile of road as follows:

	British.	German.	American.
Capital	$180,440	$95,422	$54,394
Gross receipts	17,531	11,360	6,678
Passenger earnings	7,365	3,278	1,809
Freight earnings	9,469	7,520	4,869
Working expenses	9,649	6,572	4,246
Net earnings	7,882	4,788	2,432

The gross earnings amount on the English roads to 9.71 per cent. of the capital; on the American, at the valuation in the table, to 12.28 per cent.; on the German, to 11.9 per cent.

Below we compare some of the proportions:

	British.	German.	American.
Expenses to earnings	55.04	57.87	63.58
Gross earnings to capital	9.71	11.90	12.28
Net earnings to capital	4.37	5.00	4.50
Passenger to total earnings	42.01	28.86	27.09

The German roads thus appear to be the most profitable, earning a ninth more on the capital invested in them than the American roads. Their proportion of passenger earnings is nearly the same as the American, while the British is immensely greater. In capital, earnings and expenses the German roads are intermediate between the American and the British.

For comparisons of receipts and expenses per train mile, we have to resort to the reports of the separate States, ranging from thickly-peopled Massachusetts and New York to the comparatively new State of Minnesota. The figures obtained per train mile are as follows:

	Receipt.	Expense.	Profit.
Great Britain	$1.551	$0.854	0.697
Germany	1.867	1.226	0.641
Massachusetts	1.713	1.182	0.531
New York	1.569	1.055	0.514
Ohio	1.281	0.934	0.347
Michigan	1.650	1.110	0.540
Minnesota	1.868	1.498	0.370

Here the amounts for Great Britain and Germany have been reduced to American currency on the basis of 112½ as the price of gold. Aside from Minnesota, Germany has the largest receipts and the largest expenses per train-mile. Great Britain has the largest profits and Germany stands next.

Most interesting, and most decisive as to economy of working and usefulness to the community, however, are the receipt and expense per unit of traffic—per ton and per passenger carried one mile. Unfortunately, the British reports give no information on this subject, and so our comparison of results in our States can be made only with those of each other and with those of the German Railroad Union. These are, in cents in American currency.

	Per Ton-mile.			Per Pass'ger-mile.		
	Rec't.	Exp.	Prof.	Rec't.	Exp.	Prof.
Germany	2.154	1.246	0.908	1.759	0.977	0.782
Massachusetts	2.640	1.822	0.818	2.550	1.760	0.790
New York	1.448	0.973	0.475	2.289	1.538	0.751
Ohio	1.332	0.971	0.361	2.672	1.948	0.724
Michigan	1.068	0.712	0.356	2.913	1.942	0.971
Minnesota	3.270	2.610	0.660	3.880	3.096	0.784

Thus, in all those States, except Massachusetts, where the population and traffic is at all comparable with those of Germany, the freight rate is very much lower—in Michigan only half as great; and in no State is the profit per ton per mile so great as in Germany. In passenger rates Germany is much the lowest; but our passenger rates cannot properly be compared with those of any European countries, where most of the passengers travel in the lower classes of cars. The average first-class German rate is about 3½ cents in our currency. In the profit per passenger mile there is singularly little difference. Leaving out Michigan, the profits vary from 0.724 cent on the Ohio roads to 0.790 on those of Massachusetts.

The cheapness with which our roads in well-peopled States are worked is remarkable. The American railroad is essentially a cheap railroad, compelled to be so by the high rate of interest in this country. It has been generally supposed that this saving in the interest charge is made at the cost of working expenses; that our cheap roads are more costly to work than the dearer European railroads. Yet Michigan roads seem to expend but half as much as German lines for the cost of carrying a given amount of freight a given distance.

The fact that this is done with much higher prices for labor, metals, and almost all supplies except timber and perhaps fuel, indicates that the typical American railroad with its peculiar rolling stock is not only cheap to construct, but cheap to work.

Record of New Railroad Construction.

This number of the *Railroad Gazette* has information of the laying of track on new railroads as follows:

Portland & Ogdensburg.—The connecting track from the Boston, Concord & Montreal at Scott's Mills, N. H., to the Vermont Division at the Connecticut River, which is 2½ miles long, is completed.

North Pennsylvania.—The *Delaware River Branch*, which is to form part of the new line to New York, is completed from the main line at Jenkinstown, Pa., northeast to Yardleyville, on the Delaware River, 20 miles.

Paris & Danville.—Extended southward 7 miles to a junction with the Ohio & Mississippi at Lawrenceville, Ill.

Chicago, Millington & Western.—The track, of 3-feet gauge, is laid from the west city limits of Chicago, at Lexington street, westward through Riverside to the east boundary of Dupage County, Ill., about 11 miles.

Wisconsin Central.—On the *Portage Extension*, track is laid from Stevens Point, Wis., southward to Plainfield, 23 miles.

Atchison, Topeka & Santa Fe.—Extended from King's Ferry, Cal., west to Rocky Ford, 15½ miles.

Santa Cruz.—Extended from Soquel, Cal., southeast 14 miles to Watsonville, completing the road, which is 20 miles long, and of three-feet gauge.

This is a total of 93 miles of new railroad, making 1,426 miles completed in the United States in 1875, against 1,923 miles reported for the same period in 1874, 3,883 miles in 1873, and 7,340 in 1872.

THE TEXAS & PACIFIC RAILWAY INTEREST replies to Mr. Huntington's letter recently published in these columns in two letters, published this week, to which we hardly need to call attention. Mr. Bond, the Vice-President of the Texas & Pacific, and Mr. Felsenheld, of the St. Louis Convention's committee, both object to the acceptance of the Southern Pacific's proposition chiefly, so far as public interests are concerned, on this ground: That the Southern Pacific is identical in management with the Central Pacific, and that to have a second line to the Pacific controlled by the owners of the present line would prevent any public advantage through competition, and postpone indefinitely the time when a competing railroad could be built. As Congress meets again evidently a strong effort will be made to carry through the Texas & Pacific proposition, and with more hopes of success than seemed possible a few weeks ago, when the Holman resolution was passed almost unanimously.

ERIE BONDHOLDERS, it is reported, have approved, at a stormy meeting, the plan of reorganization proposed by Sir Edward Watkin's committee, giving that committee power to modify it. The approval of the stockholders, however, is what is most important, and no result of a public meeting will be decisive on this. Only when they have paid in their assessment of six dollars per share will they have given effective consent.

LAKE SHORE STOCKHOLDERS will be delighted to receive a 2 per cent. dividend, the first for two years, earned by the severest economy with the lowest rate ever reported by a great American railroad—a trifle less than a cent per ton per mile. The surplus for the last half year is $1,075,000, which the 2 per cent. dividend will very nearly absorb.

THE FIRST CHINA RAILROAD is to extend from Shanghai to Woosung, 9½ miles, and be of 2 ft. 6 in. gauge. The company's title is the "Woosung-road Company (Limited)." Mr. John Dixon, of London, has the contract, and the materials for the road have already been shipped. It is intended to have it completed by next July. It is thought that it will attract a

large Chinese passenger traffic and be so successful as to warrant the construction of roads for a heavy traffic between the more important Chinese cities.

"THE WEAR OF RAILS AS AFFECTED BY THEIR QUALITY," Mr. Ashbel Welch's last report to the American Society of Civil Engineers, is recommended to the attention of its readers by the Belgium *Moniteur des Interets Materiels*, which says of it: "It is the most practical and the most complete work that we possess on a subject of the highest importance, and deserves to be studied by railroad engineers as well as by the managers of iron works."

How "Goods Guards" Work in England.

A "goods guard"—about equivalent to an American freight conductor—of the Midland Railway writes as follows to the *Railway Service Gazette:*

It was reported in Monday's *Daily Telegraph* that the Great Northern goods guards had a meeting near King's Cross, when it was decided to ask for several concessions—viz., 10 hours per day, each day to stand to itself. Sunday time from 12 on Saturday night to 12 on Sunday night, thus 24 hours Sunday time to be paid for as eight hours per day, independent of the week's working.

This report has been read and discussed with much interest by the Midland goods guards, who have been working as follows, and have been paid strictly to the hour—viz.: 10 hours per day or 60 hours per week, for about four years, Sunday time being paid for as above stated after 12 months' service. When we got the first concession it was received with much satisfaction, and we thought we should never want anything else, and the second was received with warm expressions of gratitude. But to our surprise we soon found that we wanted something else—viz.: each day to stand by itself. All time worked over 10 hours per day to be counted at the rate of eight hours for a day's work.

We frequently have to work the 60 hours in a few days at the latter end of the week almost without rest, being called on duty nine or ten times for a week's wages. We are changed about from one train to another, if the former is likely to cause two or three hours overtime to be made, or only 56 or 58 hours. A list of trains is made out for a man to work through the week. This man goes to bed at 10 or 11 p. m., thinking that his train is due out 8, 9 or 10 a. m., but to his surprise he is called up at 1, 2 or 3 in the morning. Having nothing ready for early duty, we go to work with cold, dry food, and without our usual beverage, cold tea, and with no chance of making any. Then we get a pint of beer in our bottle, but if an inspector or stationmaster sees us fetch it we are reported and fined 2s. 6d., and cautioned not to be seen at it again.

On Saturday there are always several men who have worked 56 or 57 hours; they are called up at 1, 2 or 3 in the morning to work a short trip on a shunting engine to complete the sixty hours. Each man is relieved as soon as the 60 hours is up, thus three or four guards are often called on duty to work one engine 12 hours. If a man has worked 58 hours and 30 minutes, he is called on duty at 10 p. m. on Saturday and at 12 midnight Sunday time commences. If this cannot be managed, he is called on duty at 10 to stay till 12, if only to walk about the yard when no special train is required. In the case of men on single trip trains, or what is known as "lodging out" trains, if their three journeys do not make 60 hours, excluding Sunday time, they will have to work an early morning train, a special train, a shunting engine or a booked train, or come on duty several hours before their train is due to leave on the last outward journey, in order to make up the time. As he has to have his food with him, he will sometimes have three days' food to carry about. He will perhaps be allowed 15 to 20 hours at the foreign station, and the same time for the homeward journey. We have men working in this way who have not had a single night at home for months.

Injunctions to Railroad Employes.

Mr. D. W. C. Rowland, the General Superintendent of the Transportation Department of the Louisville & Nashville Railroad, has issued the following circular to the employes of the road:

I wish to lay before the employes of this department a sketch of the policy which the company desires carried out, and in which I earnestly request the hearty co-operation of every officer and employe in the department.

FIRST—*Economy.* The degree of success in every business, but especially of a railroad, depends on the amount of attention paid to economy. I therefore earnestly desire that this element have close attention; that the operative force be always kept at a minimum consistent with efficiency; that no supplies or material be wasted or unnecessarily used, and generally that everything is done in the most economical manner, and every item of unnecessary expense be cut of. The attention of division superintendents, agents and others is especially called to this heading; they are expected to retrench at all times whenever they can see an opportunity to do so.

SECOND—*Promptness and attention to business* is another element indispensable to success, and I desire that it be displayed by every one in the department; that all correspondence be promptly answered, and full particulars of the matters in point given in the first instance, so as to avoid loss of time and labor in obtaining full information by subsequent correspondence. Reports of accidents and complaints should be rendered without delay, as promptitude in dealing with the parties affected frequently prevents serious trouble and loss. Freight for shipment should be dispatched without delay, and consignees of freight notified promptly as per rules in local freight tariff.

THIRD—*Courtesy.* We cannot expect to secure and retain business unless we are courteous and obliging in all our intercourse with patrons of the road. Employes, therefore, of all grades, are required to give prompt and polite attention to every one who approaches them for information, no matter how humble the person may be, and in a frank and affable manner give the information wanted; or if unable to do so, direct them where to go to get it. Be courteous and obliging to every one, and ready to tender information and assistance even before it is asked, endeavoring to please everybody you are thrown in contact with in the way of business or when traveling on the company's trains, at all times avoiding any appearance of irritation, disputes or controversies with patrons of the road, although there may sometimes seem to be cause to do so.

It is the desire of the company to have the road, its officers and employes, become popular and gain the confidence and good will of their patrons, and anything done adverse to this policy by any one will cause him to be looked upon as unworthy of his position.

It is earnestly desired that employes of all grades give attention to the points above specified; and I would further add that in making appointments and promotions due regard will be paid to the former record of the parties for civility and courtesy, and these will be considered among the foremost qualifications necessary to secure a position or promotion.

General Railroad News.

ELECTIONS AND APPOINTMENTS.

Baltimore & Ohio.—It is reported that Gen. George B. McClellan is to be General Manager or Superintendent of this road. Gen. McClellan's railroad experience was chiefly with the Illinois Central and the Ohio & Mississippi, from which latter he was appointed Major-General.

Railway Mail Service.—Mr. Theodore M. Vale, now Assistant Superintendent, is to succeed Mr. Bangs as Superintendent of Railway Mail Service.

Utica, Chenango & Susquehanna Valley.—At the annual meeting in Utica, N. Y., Dec. 28, the following directors were chosen: Samuel Sloan, John Brisbin, William E. Dodge, Moses Taylor, Lewis Lawrence, Miles C. Comstock, Daniel Crouse, Hiram Hurlburt, Percy R. Pyne, Eli Avery, Geo. W. Chadwick, Daniel B. Goodwin, Devillo White.

Memphis & Charleston.—The operating departments have been reorganized and the following appointments made, to take effect Jan. 1: W. J. Ross, Superintendent Transportation and Road Department; James A. Ogden, Superintendent Freight and Passenger Department; M. S. Jay, Ticket and Passenger Agent; John B. Gallaway, Freight Agent; Niles Merriwhether, Consulting Engineer. The changes made are in title only, not in the officers.

Wheeling & Lake Erie.—At the annual meeting in Leesville, O., Dec. 21, the following directors (one-third of the board) were chosen for three years: S. B. Bartlett, T. G. Lockwood, C. McNeely, S. Sutherland. The board re-elected Joel Wood President; Cyrus McNeely, Secretary; N. Hussey, Treasurer: A. K. Robinson, Chief Engineer.

Atchison, Topeka & Santa Fe.—There is a report that Mr. Charles W. Mead is to be General Superintendent. Mr. Mead is well known as General Manager of the Northern Pacific and was formerly General Superintendent of the Union Pacific and the Hannibal & St. Joseph.

Cheraw & Darlington.—The following are the officers recently chosen for the ensuing year: President, Maj. B. D. Townsend; directors, W. T. Walters, B. F. Newcomer, R. R. Bridgers, A. F. Ravenel, Thomas Frost, C. P. Townsend, J. B. Breeden, D. Malloy, W. A. Carrigan, L. M. Coker.

New York Central & Hudson River.—Mr. George Woodworth has been appointed Manager of the Telegraph Department, with office at Syracuse, N. Y.

Chesapeake & Ohio.—Gen. William C. Wickham, Vice-President of the company, has been appointed Receiver by the Virginia State Court and will take possession as soon as the accounts of Mr. Henry Tyson, the Receiver appointed by the United States Circuit Court, are settled.

Canada Southern.—Mr. Cornelius Vanderbilt has been chosen President.

Chippewa Falls & Western.—At the annual meeting in Chippewa Falls, Wis., Dec. 28, the following directors were chosen: Thad. C. Pound, L. C. Stanley, D. E. Seymour, H. S. Allen, A. E. Pound, E. D. Stanley, B. E. Reid, J. M. Bingham, V. W. Bayless. The Board elected T. C. Pound, President; H. S. Allen, Vice-President; L. C. Stanley, Secretary and Manager.

PERSONAL.

—On Christmas day Mr. E. P. Lyman, Superintendent of Telegraph of the Chicago, Dubuque & Minnesota and the Chicago, Clinton & Dubuque roads, was presented with a valuable gold watch by his friends on the road.

—Mr. H. B. Torrey, for many years in charge of the Chicago, Burlington & Quincy round house at Aurora, Ill., but now in the service of the United States Rolling Stock Company, was married Dec. 21, at Coldwater, Mich., to Miss Mattie E. Hard.

—The employees of the machinery department of the Lake Superior & Mississippi Railroad presented the Master Mechanic, Mr. S. W. Leslie, with a handsome gold watch and chain in St. Paul, Dec. 31.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

Year ending Sept. 30:

	1874–75.	1873–74.	Inc. or Dec.		P. c.
Cheraw & Darlington	$59,955	$59,379	Inc..	$576	1.0
Expenses	36,001	39,269	Dec..	2,668	6.8
Net earnings	$23,354	$20,110	Inc..	$3,244	16.1
Earnings per mile	1,499	1,484	Inc..	15	1.0
Per cent. of expenses	61.05	66.13	Dec..	5.08	7.7

Two months ending Nov. 30:

	1875.	1874.			
St. Louis, Iron Mt. & So.	$318,369	$695,262	Inc..	$123,107	17.7
Expenses	440,363	.....	.....	.....	....
Net earnings	$378,006	.....	.....	.....	....
Per cent. of expenses	53.81	.....	.....	.....	....

Month of November:

Cairo & St. Louis	$28,268	.....	.....	.....	....
Toronto, Grey & Bruce	33,653	$31,638	Inc..	$2,015	6.4

Third week in December:

Canada Southern	$33,926	$27,021	Inc..	$6,905	25.6
Denver & Rio Grande	8,902	6,745	Inc..	2,157	32.0
St. Louis, Iron Mt. & So.	122,800	91,328	Inc..	31,472	34.5

Week ending Nov. 23:

Atlantic & Great Western	$105,171	$97,748	Inc..	$7,423	7.6

Week ending Dec. 10:

Great Western	£17,389	£18,049	Dec..	£660	3.6

Week ending Dec. 11:

Grand Trunk	£43,900	£43,500	Inc..	£400	0.9

The Denver and Rio Grande report for 1875 includes $2,097 construction freight for the Trinidad Extension. Excluding this, the increase is only $60, or 0.9 per cent.

Freight Rates.

A conference was held in New York, Dec. 30, at which all the trunk lines were represented, including the Grand Trunk. The meeting was private, but it is said that the Grand Trunk at first declined to join in any agreement, but finally consented, at an evening session, to come in, on what terms is not known. It was agreed to raise the rates on west-bound freight to those existing before the trouble about the Boston business, the new basis to be 75 cents per hundred for first class from New York to Chicago. The change will be made as soon as the details can be arranged.

Coal Movement.

For the year ending Dec. 31, the coal shipments from the Jefferson County (Ala.) coal mines over the South & North Alabama road were as follows, December being partly estimated: 1875, 57,314 tons; 1874, 33,139 tons; increase, 24,175 tons, or 72.7 per cent. This increase is due to the development of the mines and the growth of the local demand for this coal along the line.

There is to be a general stopping of production in the Wyoming anthracite region, which will probably continue during the month of January, the individual operators having agreed to join with the transportation companies in closing their collieries.

The New York State Canals.

The message of Gov. Tilden, of New York, contains the following statement of the earnings and expenses of the canals for the fiscal year ending Sept. 30:

	1874–5.	1873–4.	Decrease.	P. c.
Receipts for tolls, etc.	$1,925,995 63	$2,947,972 91	$1,021,977 28	34.7
Expenses	1,467,315 95	1,469,466 83	2,150 88	0.1
Balance	$458,679 68	$1,478,506 08	$1,019,826 40	69.0
Per cent. of expenses	76.18	49.85	....	....

The Erie Canal earned $1,708,374.72, being $904,389.63 in excess of ordinary expenses and $231,290.86 in excess of all disbursements, including extraordinary repairs and new work. The Champlain Canal earned $110,893.17, which was $25,049.34 less than the ordinary expenses, and $268,393.23 less than all disbursements. The earnings of the lateral canals were less by $297,942.58 than the disbursements upon them.

Buffalo Rail Traffic in 1875.

The Buffalo *Commercial Advertiser* says:

"The beneficial effect of the opening of the International Bridge upon the railway business of Buffalo is shown by the annual statement, published elsewhere, of the movement of property through this city by rail. Previous to the construction of the bridge very little grain or live-stock was received from the West through Canada; but in two years the business has reached large proportions. The receipts of flour over the bridge in 1874 reached 219,202 barrels, but this year that route is credited with 813,600 barrels. The total import of all kinds of grain last year was 4,918,690 bushels; this year it is nearly three times as great, namely, 11,937,440 bushels. A similar increase is observable in all other leading articles of commerce. The amount of lumber received over the bridge in 1874 was reported at 17,885,000 feet; this year 32,854,000 feet have arrived. The increase in the imports of staves is over five million pieces, and that in shingles over twenty-three millions. The movement of wool, cut meats, pork, lard and grease is also largely in excess of last year's. The receipts by this route, it should be remembered, include those of the Canada Southern, Great Western and Grand Trunk railways.

"The Lake Shore Railroad has not held its own this year. The movement in breadstuffs in particular shows a large decline. The aggregate receipts of all kinds of grain this year were only 8,647,600 bushels; in 1874 they were 21,699,300 bushels. Those of flour were 650,300 barrels this year and 1,416,000 barrels last year. In the general traffic there has been a corresponding decline. The imports of lumber were 16,888,000 feet this year and 41,256,000 in 1874. Those of wool were 22,612 bales, as compared with 52,971 last year. The causes which have resulted in this falling off are various, but the loss is principally due to the active competition of the new lines.

"A large increase is seen in the exports of grain to the East by rail this year. Of the 73,418,385 bushels of grain received here by lake last season 15,010,245 bushels were sent forward by rail. Last year the shipments aggregated only 11,381,794. This large gain is chiefly due to the increased attention which the New York Central and the Erie officials have given to this business. Hitherto no special effort was made to develop it; but this year better facilities have been provided, and the effect is seen in a gain of nearly fifty per cent. over last year. We have good reason for believing that greater inducements will be offered to shippers to forward by rail next season than ever before. What with the railways and the canal, there is no danger that a fair proportion of the western grain movement will not reach the seaboard via this route."

ANNUAL REPORTS.

Erie.

The report for the year ending with Sept. 30, 1875, is just returned to the State Engineer and Surveyor.

The figures are:

	1874–75.	1873–74.
Main Line owned (Jersey City to Dunkirk)	459.00	459.00
Branches owned	96.75	96.75
Branches leased	337.43	342.75
Branches worked	49.32	60.50
Total road worked	942.50	959.00

The only difference here is a decrease of 16.50 miles in leased branches, caused by the difference between the 20.75 miles of the Hackensack Branch (now New Jersey & New York Railroad), which the owner now works directly, and the 4.25 miles of the new Erie & International Railway, from the main street depot in Buffalo to the east end of the International Bridge, plus the 11.18 miles of the Paterson & Newark Railroad transferred from the catalogue of "branches operated" to that of "branches leased," which makes a similar difference in the mileage of "branches operated."

The mileage of track was:

	1875.	1874.
First track	942.500	959.000
Second track	306.350	306.350
Side track	337.428	315.290
Third rail*	114.300	114.300
Total	1,643,428	1,637,790

Here the only changes are in the sidings, which have been extended 22.138 miles. Much of these sidings was constructed to accommodate the traffic forced over the Rochester Division after the burning of the Portage bridge.

The mileage of road owned at the close of the year was 555¾; the mileage of track owned, 971.213. Thus the company owns about 59 per cent. of the road it works, and just about the same proportion of its track; that is, the sidings and double track are pretty evenly distributed over the owned and leased roads.

The weight of rail per yard is: steel, 60 to 67 lbs.; steel-top, or silicon iron top, 67¼; iron, 50 to 70 lbs.

There are 44 engine houses with stalls for 321 engines, 8 machine and 8 car repair shops.

The equipment has been reported as follows for two years:

	1875.	1874.
Locomotives:—		
In good condition	239	103
In fair condition	194	102
In bad condition	28	66
Broken up	44	36
Total	505	505
Cars:—		
1st-class passenger	198	200
2d-class passenger and emigrant	67	69
Baggage, mail and express	93	75
Freight cars	11,274	10,775

The changes are an increase from 36 to 44 in the number reported as "broken up," which means that the company has eight fewer locomotives than last year, and that instead of 505 (reported as the "number on the books of the company,") there were last September but 461. The changes in condition reported are the falling off of 62 engines last year reported in "good" condition; an increase of 92 of those in "fair" condition, and an increase of 38 of those in "bad" condition. Unless, then, raising 30 locomotives from bad to fair condition is equal to the destruction of 8 in bad condition and the falling off of 62 from good to fair condition, the motive power would appear to have depreciated during the

* Two miles of third rail are counted as one mile of track.

year. If, as is probable, the difference between "bad" and "fair" is intended to be equal to that between "fair" and "good," the depreciation would be measured by the value of the eight engines broken up plus the amount of difference between 30 in "good" and 30 in "fair" condition.

Besides this property, the company owns large amounts of the stocks and bonds of other corporations and some other property which the form of report stipulated by law does not provide for.

The entire property is represented by the following:

	1874-75.	1873-74.	Inc. or Dec.
Capital stock.....	$86,536 910 00	$86, 536,910 00	....
Funded debt	54,371,814 00	45,576,814 00	Inc.$8,695,000 00
Floating debt....	1,421,641 83	2,552,203 34	Dec. 1,130,561 51
Total	$142,230,365 83	$134,665,927 34	Inc. $7,564,438 49

The average rate of interest on the funded debt, reduced to currency, was 7.64 per cent., at which rate it amounted (on the debt at the close of the year) to $4,146,367.

The amount of stock and debt per mile owned are:

	1875.	1874.
Stock	$155,694	$155,694
Funded debt	97,471	82,009
Floating debt	2,558	4,574
Total	$255,723	$242,277
Increase (4.87 per cent.)	13,446	

While the stock and debts reported amount to $142,230,366, the itemized report of cost of road and equipment gives the total cost as $115,995,946.63, which is $920,045.76 more than for the preceding year.

The chief item in this increase is about $453,000 for freight cars, which is due chiefly to the purchase of the cars formerly leased at an exorbitant rent from the Jefferson Car Company. The changes in cars are a decrease of two first-class and two second-class passenger cars, an increase of 18 baggage, mail and express cars, and an increase of 499 freight cars. The increase in the cost allows about $800 each for the freight cars, but the purchase was made as a settlement of a suit.

There are increases of $76,500 for graduation and masonry; $57,000 for bridges; $262,000 for superstructure, including iron; $92,800 for stations, buildings and fixtures, and *decreases* of small amounts in several items.

The work done for two years has been:

Train mileage—	1874-75.	1873-74.	Inc. or Dec.	P.c.
Passenger....	3,202,392	3,259,941	Dec.. 57,549	1.8
Freight.....	9,405,024	9,863,760	Dec.. 458,736	4.6
Total.....	12,607,416	13,123,701	Dec.. 516,285	4.0
Passengers carried..	5,052,855	4,223,130	Inc... 829,725	...
Passenger mileage...	155,396,804	160,204,125	Dec.. 4,807,321	3.0
Tons carried.....	6,239,943	6,364,276	Dec.. 124,333	...
Tonnage mileage....	1,016,618,050	1,047,420,238	Dec..30,802,188	2.94

The average train load was, then:

	1874-75.	1873-74.
Passengers, number	48.5	49.1
Freight, tons	108.1	106.2

This shows a decrease, but only a very slight one, in the bulk of the traffic—a trifle less than 3 per cent., nearly the same in passengers and freight; and this work was done with a train mileage less by 4 per cent., showing a more effective handling of the traffic.

The receipts for this work were:

	1874-75.	1873-74.	Inc. or Dec.	P. c
Passengers..	$3,461,304 31	$3,705,574 06	Dec... $244,269 75	6.6
Freight	12,: 87,399 85	13,740,042 44	Dec...1,352,642 59	9.8
Expenses ...	509,953 40	526,487 83	Dec... 22,534 43	4 3
Mails	400,656 73	389,005 71	Inc... 11,651 02	3.0
Rents	64,826 21	41,846 24	Inc... 22,979 97	55.0
Miscellaneo's	158,718 10	195,942 48	Dec... 37,224 38	19 0
Total from railroad..	$16,876,858 60	$18,598,898 76	$1,722,040 16	....
From other sources:*				
Pavonia Ferry.	$219,168 98			
Pavonia Horse Railroad....	24,098 69			
Erie baggage express.....	71,020 46			
Weehawken docks	66,061 45			
Grand Opera House rents.	36,095 25			
Unclaimed fr't & baggage.	6,586 64			
Interest on securities.....	205,625 21			
Receipts from claims due before Oct. 1, 1874.....	172,236 21			
Total inc...	$17,677,746 49	$18,598,898 76	$921,152 27	4.95

The working expenses were:

	1874-75.	1873-74.
Maintenance of road and real estate..	$3,321,370 57	$3,485,662 20
Maintenance of equipment.....	2,446,863 53	2,799,102 30
Operating the road.....	6,910,896 85	7,278,973 82
Total working expenses.....	$12,679,130 95	$13,563,738 32
Percentage of expenses to earnings..	75.13	72.93†

The net earnings from the road were thus:

1874-75.	1873-74.	Decrease.	P. c.
$4,998,615 54	$5,035,160 44	$36,544 90	0.73

Out of these net earnings were paid:

Interest:	1874-75.	1873-4.
Interest on funded debt.....	$3,761,964 50	
" on Long Dock bonds.....	210,000 00	
Guaranteed interest on Boston, Hartford & Erie bonds—		
To Delaware & Hudson Canal Co.....	105,000 00	
To Weehawken Docks.....	28,000 00	
Weehawken dock mortgage.....	66,671 93	
On short loans.....	175,412 89	
On outside property, mortgages, etc..	31,382 28	
Go d premiums for gold interest.....	114,247 34	
Interest on mortgage debt.....	.....	$2,799,805 64
Other interest.....	.....	165,807 00
	$4,492,677 94	$2,965,612 64
Rental charges:‡		
Paterson & Newark	$11,192 52	$11,875 90
Suspension Bridge & Erie Junction	38,705 02	56,977 98
Loss in working Cincinnati, Hamilton & Dayton Railroad as Cincinnati entrance of Atlantic & Great Western....	62,804 07	61,625 65
Other rentals	689,013 25	717,345 75
Total rental charges	$801,714 86	$847,825 28

* Not separated for 1873-74.

† These proportions cannot be compared properly for the two years, because a separate statement of some of the sources of income is made for the last year, which in the report previous were included in the receipts from the railroad.

‡ We have placed under this head the amounts paid the Paterson & Newark and Suspension Bridge roads, which seem to have been leased for certain percentages of gross earnings, with a guarantee that they should not be less than certain fixed sums. The report appears to place the percentages of earnings with "rentals," and to charge the differences between these and the guaranteed amounts separately, as here given. The loss on the Cincinnati, Hamilton & Dayton is in accordance with a contract by which the Erie agreed to assume a proportion (one-half, we believe,) of any such loss.

*Taxes:**	1874-75.	1873-74
In New Jersey on equipment.....	$19,337 38	$20,208 29
On Opera House, Long Dock, etc.....	.....	101,619 22
In Pennsylvania on gross receipts from May, 1868, to July, 1873†.....	81,635 14	20,819 24
	$100,972 47	$151,646 75
Hire of cars.....	94,500 00	460,955 48
Claims due the previous year.....	321,346 06	143,313 75
Other miscellaneous expenses.....	539,867 98	451,670 93

Summarizing, we have:

Total receipts.....	$17,677,746 49	$18,598,898 76
Total expenditures.....	19,030,911 26	18,584,763 15
Surplus.....	.....	$14,135 61
Deficit.....	$1,353,164 77	.....

The average rates received per passenger per mile, in cents, are given as follows:

	1874-75.	1873-74.
First-class through.....	2.041	2.032
First-class way.....	2.536	2.755
Commutation.....	0.750	.....
Emigrant through.....	1.821	1.197
Emigrant way.....	1.541	1.587

A calculation shows that the average receipt per ton per mile was 1.209 cents in 1874-75, against 1.312 in 1873-74, the decrease amounting to 0.103 cent. The maintenance of the latter rate would have added more than a million dollars to the net earnings.

During the year the numbers of persons killed and injured on the road were 106 killed and 203 injured. Of the killed, 5 were passengers, 41 employes and 60 other persons; of the injured, 11 were passengers, 145 employes and 47 other persons. Ten employes were killed and 98 injured in coupling and uncoupling cars.

* Taxes on real estate are included in working expenses.

† This tax has been contested; it is now abolished.

THE SCRAP HEAP.

Railroad Manufactures.

Messrs. Porter, Bell & Co., at Pittsburgh, are building an engine for exhibition at the Centennial.

The Crucible Steel Casting Company, of Pittsburgh, recently turned out an unusually excellent lot of cast steel reversible frogs for the Phillips & Colby Construction Company.

The Joliet (Ill.) Iron & Steel Works stopped work in the steel mill Dec. 23, for the purpose of putting in new fourteen-inch blooming rolls in the place of the old twelve-inch rolls which they have heretofore used. In the future they will make three-rail ingots instead of two. They will resume work some time in the latter part of January. The iron department is now in full operation, but will shut down for an indefinite period in a few days.

The Delaware Rolling Mill at Phillipsburg, N. J., is closed for the present.

The Indianapolis Rolling Mill is re-rolling a lot of rails for the Louisville, New Albany & Chicago road. A new set of rolls for light rails, is to be added to the mill.

The Pequest Furnace at Oxford, N. J., is to be sold at sheriff's sale, Jan. 20.

The Jackson & Sharp Company at Wilmington, Del., recently turned out some sleeping cars for the Lucas Sleeping Car Company.

The King Iron Bridge Company at Cleveland, O., is building an addition to its works.

The Franklin Iron Company's Works, at Franklin Furnace, N. J., will not start up as expected and the miners have been discharged from the Franklin and Pochuck mines.

The Cleveland (O.) *Review* says that the Standard Iron Company reports $250,000 assets and $145,355.75 liabilities, the real estate and machinery being estimated at $174,202.39. The causes of the suspension were too large an investment in machinery and improvements; heavy losses on purchases of pig iron made in 1873; bad debts made while manufacturing boiler plate, which business has been given up, and the general depression of business. The company offers to pay in full, with interest, if extensions for 12, 18, 24, 30 and 36 months can be granted.

Riehle Brothers, of Philadelphia, are now erecting a railroad track scale of 200,000 lbs. capacity and 100 feet long at Cressona, Pa., for the Philadelphia & Reading Railroad Company.

The Scofield Rolling Mill at Atlanta, Ga., has passed out of the hands of the Receiver, the creditors having taken possession. They will continue to run the mill, having secured Mr. Wm. Goodnow, the late Receiver, as Superintendent.

The Dickson Manufacturing Company at Scranton, Pa., recently turned out five locomotives for the Albany & Susquehanna road.

The Marietta (O.) Rolling Mill is at work on a contract for rails for the Helena & Iron Mountain road in Arkansas.

The Winchell Car Ventilator.

After trial, the Canada Southern Company has resolved to adopt the Winchell Car Ventilator for all its passenger cars. The system consists of an air chamber in the roof of the car for securing the admission and even distribution of fresh air throughout the car; deflectors attached to the windows for preventing the admission of dust, cinders and rain, when the windows are open, and for exhausting the foul air from the interior of the car.

OLD AND NEW ROADS.

Atlantic & Pacific.

Referring to the efforts made by the Missouri Railroad Commissioners to secure more friendly relations between the management of this road and the people along its line, the St. Louis *Republican* says: "Recently Messrs. Walker and Marmaduke of the board of commissioners had a long conference at the general office of the Atlantic & Pacific road, with Oliver Garrison and Mr. Beach, two of the receivers, now in the city. Among the results of the conference the receivers agreed to make a reduction on the freight for common salt per barrel to Springfield, from $1.25 to $1, and a corresponding reduction along the line at other points. They consented also to make a reduction on wheat to the same point from 35 to 30 cents per bushel with a like corresponding reduction to other points. In regard to the complaints made of the misconduct, gruffness and discourtesy of the employes along the line, the receivers indicated a desire to remove all grounds of complaint, and said any charges of misconduct would be inquired into with a view of a remedy—even to dismissal of such officers as were discourteous and otherwise obnoxious to the patrons of the road. This effort of the receivers looks like a move in the right direction towards securing a better state of feeling, but it should be remembered they are not responsible for the misdeeds and discourtesies of former officials."

Montpelier & Wells River.

The annual meeting of this company was held in Montpelier, Vt., Jan. 4, there being a very large attendance. There was a sharp contest as to the ownership of 2,000 shares of stock formerly belonging to Montpelier town, which had been sold a few days before in pursuance of the vote of a town meeting to J. W. Brock, of Montpelier, while another sale was also made, under an attachment for debt, to A. R. Sartwell, of East Cambridge, Mass. The Brock party had procured an injunction to restrain Mr. Sartwell from voting on the stock, claiming that the sale was illegal. The Sartwell party moved to adjourn the meeting for two weeks, until the injunction case could be tried, while the other party pressed for an immediate election. The excitement culminated in a general fight, during which the Clerk, Joel Foster, escaped with the records, and an adjournment was finally had amid great disorder. The Brock party finally met by themselves and chose a board of directors, the legality of whose election will, of course, be contested. The underlying trouble is an attempt of the Central Vermont to gain control of the road, whose construction it fought against and delayed as long as it could.

Gilman, Clinton & Springfield.

Considerable improvements have been made on this road since the trustees came into possession. A good deal of new iron and 25,000 new ties have been laid, and much work done on the road-bed. Many of the cars have been repaired, and two new Baldwin engines put on the road, and the passenger trains are being fitted with the Westinghouse brake.

Dividends.

Dividends have been declared by the following companies:

Philadelphia & Reading, 2½ per cent., quarterly, payable Jan. 25. Transfer books were closed Dec. 31.

Delaware, Lackawanna & Western, 2½ per cent., quarterly, payable Jan. 20.

Paterson & Hudson River (leased by Erie)., 4½ per cent., semi-annual, payable Jan. 3.

Paterson & Ramapo (leased by Erie), 4 per cent., semi-annual, payable Jan. 3.

Berkshire (leased to Housatonic), 1¾ per cent., quarterly, payable Jan. 10.

Concord & Portsmouth, 3½ per cent., semi-annual, payable Jan. 1.

Pittsfield & North Adams (leased to Boston & Albany), 3 per cent., semi-annual, payable Jan. 1.

Ware River (leased to Boston & Albany), 2¾ per cent., payable Jan. 1.

Delaware, 3 per cent., semi-annual, payable Jan. 1.

Panama, 3 per cent., quarterly, payable Jan. 15.

New York, Providence & Boston, 2½ per cent., quarterly, payable Jan. 10.

Ogdensburg & Lake Champlain, 2 per cent., semi-annual, payable Jan 10.

Lake Shore & Michigan Southern, 2 per cent., semi-annual, payable Feb. 1.

Quebec Railroad Grants.

What are known as the South Shore roads in the Province of Quebec, that is the lines south of the St. Lawrence River, to which subsidies have heretofore been granted, are as follows:

1. *Phillipsburg, Farnham & Yamaska*, from Yamaska to Phillipsburg, upon Lake Champlain, near the Province line. It passes through St. Hyacinthe, near which point 10 miles are graded and the track laid. It is 100 miles in length, has a gauge of 3 feet 6 inches, and is laid with a 36-pound rail. It has a subsidy of $4,000 per mile.

2. *Montreal, Portland & Boston*, from St. Lambert to the Province line, passing through Chambly, West Farnham, Stanbridge and Frelighsburg, a distance of about 55 miles. It is entitled at present to a subsidy of $1,000 per mile. This road was formerly known as the Montreal, Chambly & Sorel, and is to be the Montreal connection of the Portland & Ogdensburg.

3. *Southeastern*, from West Farnham to the Province line, with a branch from Sorel to a point of intersection with the main line at Sutton Junction, an entire distance of 150 miles. The trunk line has been completed for two or three years, and has a subsidy of $1,000 per mile. The branch line from Sorel has a subsidy of $2,500 per mile. The branch is nearly finished from Sorel to Acton, and the rails are laid from Acton 16 miles.

4. *Mississquoi & Black River*, from Richmond to the Province line, near Richford, in Vermont, where it will form a junction with the Vermont Central, a distance of 55 miles. About 20 miles are graded, but no part of the road is in operation. It has a subsidy of $2,500 per mile.

5. *Waterloo & Magog*, from Waterloo to Sherbrooke, through Magog, 35 miles, of which a few miles are graded. It has a subsidy of $2,500 per mile.

6. *Quebec Frontier*, running along the Province line, through the counties of Huntingdon, Napierville and Missisquoi, a distance of 70 miles. It has a subsidy of $2,500 a mile. Nothing has been done on this road, and the subsidy will probably be withdrawn in February.

7. *Quebec Central*, from Sherbrooke to Levis, or it may connect with the Levis & Kennebec, as the company may choose. The charter covers a distance of 100 miles, of which 41 miles from Sherbrooke are built. It has a subsidy of $4,000 a mile. This road was formerly the Sherbrooke, Eastern Townships & Kennebec.

8. *St. Francis & Megantic International*, from Sherbrooke to the Province line on the State of Maine, a distance of 80 miles, of which 27 miles are built and in use. It has a subsidy of $4,000 a mile.

9. *Levis & Kennebec*, from Levis to the Province line on the State of Maine, a distance of 60 miles, of which 40 miles are built. It is to connect the city of Quebec with the Eastern States and the Maritime Provinces. It has a subsidy of $4,000 a mile.

10. *Baie des Chaleurs*, extending a distance of 180 miles down the lower St. Lawrence. It has a money subsidy of $1,500 and a land grant which the company decided to accept instead of the increased subsidy of $2,500 per mile. Nothing has been done on this road beyond a partial survey.

An effort is being made to secure additional subsidies for some of these lines as an offset to the aid granted to the North Shore, the Montreal, Ottawa & Western and other roads north of the St. Lawrence.

Meetings.

The following companies will hold their annual meetings at the times and places given:

Delaware, at the company's office in Dover, Del., Jan. 13, at 1 p. m.

Wilmington & Western, at the office in Wilmington, Del., Jan 10, at noon.

Internal Revenue Taxes on Railroads.

An examination is to be made with a view of securing the payment of any internal revenue taxes that may have become due during the period in which those taxes were levied, and have not been paid. The various taxes referred to are as follows, with the time during which they were levied:

Tax of 3 per cent. on gross passenger receipts, Sept. 1, 1862, to June 30, 1864.

Tax of 2½ per cent. on gross receipts, from June 30, 1864, to Oct. 1, 1870. Receipts from mails were exempt from July 31, 1866.

Tax of 5 per cent. on interest, dividends and undivided profits, from Sept. 1, 1862, to Aug. 1, 1870.

Tax of 2½ per cent. on interest, dividends and undivided profits, Aug. 1, 1870, to Dec. 31, 1871.

A number of treasury officials will be detailed to make the examinations.

Chicago, Milwaukee & St. Paul.

Notice is given that this company will take up at par and accrued interest the La Crosse & Milwaukee Division 8 per cent. extended bonds, on presentation at the company's office, No. 68 William street, New York, on and after Jan. 3. Interest on these bonds will cease May 1, 1876. The amount of these bonds by the last report was $781,500.

The contractors, Harrison & Green, who are building the new tunnel at Tunnel City, Wis., on the La Crosse Division, have so far completed their work that a construction train passed through Dec. 30, in six months and four days after the

work was commenced. The length of the tunnel through the rock is 1,330 feet. The brick arching will be finished in thirty days, and regular trains will run through three months ahead of the contract time. The completion of the new tunnel will make a considerable reduction in the grade at that point.

Long Island.

Work has been begun on the extension of the Rockaway Branch from the present terminus at Far Rockaway, N. Y., to the hotels on Rockaway Beach, some three miles.

Paris & Danville.

The track is now laid to the Ohio & Mississippi at Lawrenceville, Ill., 21 miles south of Robinson, the late terminus, and 101 miles from the northern terminus at Paris. The first regular passenger train from Paris ran through to Vincennes, Ind., Jan. 1, using the Ohio & Mississippi track from Lawrenceville to Vincennes. No further extension of the road is probable for a long time to come.

Valley, of Ohio.

Another special meeting of the stockholders is called for Feb. 1, to vote on the question of authorizing the execution of a new mortgage on the road and the issue of bonds under said mortgage.

Delaware & Bound Brook.

The grading of the whole 27 miles from the Delaware at Yardleyville to the New Jersey Central near Bound Brook is substantially completed. Tracklaying is in progress from the central junction southwestward and from Pennington in both directions. The question of the Mercer & Somerset crossing at Hopewell is not yet settled, but commissioners have been appointed by the Supreme Court, who were to meet this week and arrange the matter.

The decision of the Chancellor as to the application for an injunction against the bridge over the Delaware at Yardleyville will be announced at the next term. Meantime the bridge has been completed and is now about ready for use.

Boston Concord & Montreal.

Surveys are being made for an extension of the Fabyan's Branch from Fabyan's, N. H., to the foot of Mt. Washington and the terminus of the Mount Washington Railroad. The distance is six miles, and it is said that work will be begun early in the spring. There is also talk of a branch from Fabyan's southward to the Franconia Mountain range.

Lake Superior & Mississippi.

The St. Paul (Minn.) *Pioneer-Press* of recent date says: "We have received an advance copy of the report of J. P. Ilsley, President of the Lake Superior & Mississippi Railroad Company, submitted a few days ago to a meeting of the board of directors. This road has thus far proved an unprofitable investment to its stockholders and bondholders, and Mr. Ilsley frankly states some of the obvious reasons for this result. It was constructed under the belief that, as it furnished the shortest and cheapest outlet to lake navigation, a large portion of the wheat exports of the State would naturally seek this route. But, in fact, this road only touches the borders of the great agricultural districts of the State, which are penetrated mainly by roads terminating on Lake Michigan, and the wheat traffic is chiefly controlled by them. The independent roads, which do not terminate in Milwaukee or Chicago, are the St. Paul & Sioux City and the St. Paul & Pacific; but heretofore a large proportion of the wheat carried by these roads has been required by the Minneapolis mills, and though the Superior road takes a large share of the flour produced there during the six months of navigation on Lake Superior, the greater share is controlled by the Milwaukee lines. The following table shows the number of bushels of wheat moved by the railroads of Minnesota for the year ending June 30, 1874:

Railroads.	Bushels.
Northern Pacific	144,456
Minneapolis & St. Louis	231,958
St. Paul & Pacific	1,463,410
St. Paul & Sioux City	2,376,132
Chicago, Milwaukee & St. Paul	2,815,064
Chicago, Milwaukee & St Paul, Iowa & Minn. Division	1,904,054
Winona & St. Peter	7,046,875
Southern Minnesota	3,249,342
Lake Superior & Mississippi	1,544,000
Total	20,774,282

"This table, with the explanation above given, sufficiently answers the question why so small a proportion of the wheat of Minnesota goes to the lakes by its cheapest and most natural outlet.

"Mr. Ilsley thinks the building of the branch railroad from White Bear to Stillwater was an unprofitable investment; and though the rental has been reduced to $20,000 per annum, he doubts whether even at this rent it can be made remunerative, as all wheat passing over it comes from points where strong competition prevails and where it can be sent down the Mississippi River nearer Chicago than Stillwater is to Duluth. He says if the money expended on this branch had been used in extending the road south of Minneapolis or in building a road south from St. Paul into the wheat fields of the State it would give the road a larger supply of wheat at better rates of transportation.

"The whole freight passing northward over the Lake Superior & Mississippi Railroad amounted for the year, we suppose, ending Dec. 1, 1875, to 86,559 tons, of which 24,000 tons were wheat, 31,562 tons flour, and 25,099 tons of merchandise and grain other than wheat. The freight passing southward amounted to 89,663 tons, of which about 33,500 tons were coal, salt and other merchandise received at Duluth; 19,759 tons of wood for St. Paul, and 32,705 tons of lumber—leaving but 3,699 tons of way traffic, of which the Northern Pacific contributed more than half. The line of the road is at present sparsely settled, there being only 8,190 people between Duluth and St. Paul within ten miles of the road.

"Mr. Ilsley thinks that after a few years, when the pineries on the upper Mississippi are exhausted, a large lumber traffic will pass over the road from the St. Louis River. The pine on the company's lands is estimated at 1,000,000,000 feet, of which 500,000,000 are on the St. Louis River. But to make these pine lands available a branch road from the Northern Pacific Junction to Knife Falls, a distance of six miles is necessary.

"The receipts of the railroad for the year 1875 will be about $525,000, while the expenditures will be about the same, leaving nothing to provide for former liabilities or the interest on the bonds. The receipts are $80,000 less than in 1874, owing to the depression of the lumber trade, while the expenditures have been larger on account of renewals of tracks and bridges.

"He shows, however, that the receipts of the road per mile are equal to the average of those in Minnesota, being $3,158 per mile on this road, for example, as against $2,813 per mile for the year ending June 30, 1875, on the road from St. Paul to Sioux City. Mr. Ilsley concludes that under these circumstances it is apparent that the stockholders cannot be expected to provide from the earnings of the company sufficient to meet the interest on its indebtedness, as the interest will grow faster than the indebtedness, and he sees no other way than to adopt some plan of reorganization which will bring the liabilities of the company nearer to the par value of the road, and also place the company in such a financial condition that it will be able to do what is absolutely required to make the property capable of yielding future revenues. The present indebtedness of the company is $10,690,803. The lands belonging to the company he estimates as worth about $3,118,519, leaving about $7,500,000 to be represented by the road, or $48,077 per mile of road. The average cost of the road and equipment and interest paid to first-mortgage bondholders from other sources than earnings has been over $50,000 per mile. * * *

"It is obvious that all that is needed to make this road a productive investment, and to give it its proper rank as the natural outlet of the wheat exports of the State, is to bring it into connection, by a system of tributary or independent lines, with the great wheat districts of the State. A road south from St. Paul and an extension of the Minneapolis & St. Louis road south from Carver would supply it with all the wheat it could handle, while such roads would develop a competition in the interior districts of the State which would regulate freight rates far better than by any arbitrary legislation. But in the meantime the settlement and wheat development of the regions tributary to the St. Paul & Sioux City and St. Paul & Pacific railroads is progressing with such marvelous rapidity that the overflow from these districts will in a year or two immensely swell the receipts of the Superior road."

Canadian Pacific.

The surveying parties working eastward from the Pacific and westward from the Red River of the North have met and the line of surveys across the continent is complete. The meeting point was in latitude 53° 6′ 36″ north, longitude 113° 2′ 45″ west. From present appearances, however, it is not likely that any further use of these surveys will be made for a good while to come.

Detroit River Tunnel.

Notice has been given that application will be made to the Canadian Parliament for a charter to incorporate a company to build a tunnel under the Detroit River at Amherstburg.

Pacific, of Missouri.

Under the Missouri lien law of 1873 a number of claims for materials and supplies furnished for this company and the Atlantic & Pacific are being filed with the Secretary of State of Missouri. The largest claims are those of the St. Louis Car Wheel Company, the Springfield Iron Company and the Litchfield Car Manufacturing Company. The law requires this filing with the Secretary of State by the circuit clerks.

Michigan Central.

The semi-annual statement for the six months ending Nov. 30, gives the earnings for that period as follows:

	1875.	1874.	Inc. or Dec.	P. c.
Gross earnings	$3,373,218	$3,624,570	Dec. $251,352	6.9
Working expenses	2,383,876	2,288,375	Inc. 95,501	4 2
Net earnings	$989,342	$1,336,195	Dec. $346,853	26.0
Interest account	804,247	754,032	Inc. 50,217	6.7
Surplus	$185,093	$582,163	Dec. $397,070	68.2
Per cent. of expenses	70.67	63.14	Inc. 7.53	11.9

The decrease in earnings is ascribed to the great reduction in through rates due to the competition of parallel lines, and the low rates received for Grand Trunk freight.

The debt of the company is as follows:

First-mortgage bonds	$556,000
First-mortgage sinking fund loan	2,179,000
Consolidated mortgage	8,000,000
Bonds for equipment	556,000
Total	$11,291,000
Less bonds in sinking fund	601,000
Balance	$10,690,000
Floating debt	964,440
Total debt	$11,654,440

The floating debt increased $194,424 during the six months, the increase being mainly due to the purchase of steel rails recently made.

Ogdensburg & Lake Champlain.

The directors have declared a semi-annual dividend of 2 per cent. on the common stock, which is a reduction from the usual 3 per cent. and the amount ($30,000 semi-annual) will be appropriated towards the payment of equipment bonds maturing in two years. By the terms of the lease with the Vermont Central the rate of 8 per cent. per annum, instead of 7 cent. now paid, commences March, 1876.

North Wisconsin.

There is a rumor that Mr. Jacob Humbird, the principal owner of this road, has sold his interest to some parties who are interested in the St. Paul & Sioux City road, and that work on the extension will be resumed. Nothing definite is known about the matter, however.

Lake Shore & Michigan Southern.

At a meeting of the board held in New York, Jan. 5, the following statement was submitted:

The operations of the road for the six months ending Dec. 31 were as follows:

Gross earnings	$7,545,000
Working expenses and taxes	5,051,000
Net earnings	$2,494,000
Interest, rentals and dividends on guaranteed stock	1,419,000
Surplus	$1,075,000

As compared with the same period in 1874, there was a decrease of $873,000 in freight and of $133,000 in passenger earnings, with an increase of $57,000 in miscellaneous, leaving a net decrease of $949,000. The loss on freight was caused by a diminution of 7.66 per cent. in the volume of traffic, and of 15.65 per cent. in the prices received. The average rate per ton per mile in 1875 was 0.997 cent; in 1874, 1,182 cents.

The cost of steel rails, in excess of the value of the iron rails for which they were substituted, is included in operating expenses. The amount of steel rails laid on main line, during 1875, was about 12,000 tons; and the amount of iron rails (laid principally on branch lines) during the same period was about 9,000 tons. The amount of steel rails to be laid on main line during 1876 will, it is estimated, be about 15,000 tons. A considerable part of the steel rails laid in 1875 having been paid for with old iron rails (the full value of the steel being, however, included in the operating expenses above stated), the money which would otherwise have been expended therefor is in hand and constitutes a fund applicable to providing the steel rails intended to be laid in 1876. The road, machinery and property of the company has been, in all respects, fully maintained at its standard high condition.

The bonded debt Dec. 31, was $36,250,000, against $36,500,000 by the last report, having been decreased $250,000 by the operation of the sinking fund.

The board, after considering the statement, resolved to declare a dividend of 2 per cent. for the half-year, to be payable Feb. 1.

Grand Rapids & Indiana.

The trustees under the first mortgage, G. W. Cass and T. A. Scott, will receive at their office, No. 23 Fifth avenue, New York, until noon of Jan. 15, proposals for the sale to them of $45,000 of the first-mortgage gold bonds, dated Oct. 1, 1869, for the sinking fund, as provided in the mortgage.

Alabama & Chattanooga.

In the United States Circuit Court in Mobile, Ala., Dec. 29, Judge Woods sitting, this case came up and the arguments were opened by Mr. Snagge, of London, counsel for the foreign bondholders. Mr. Snagge's address occupied two days, and went very fully into the history of the various litigations and especially into the transactions of Messrs. Rice and Haralson while receivers. The bondholders contest the validity of the receivers' certificates issued by these parties, of which $400,000 were sold and $700,000 hypothecated for advances. It is charged that many of them were not sold, but were issued in payment of claims which should not have been settled at all, or which had no lien upon the road superior to the first mortgage; that the receivers were interested in some of these claims; that the hypothecated certificates were not negotiable instruments at all, and could not legally be used in this way; that many of the advances made were on usurious terms, and were made by the receivers themselves and their associates. Opposition is also made to claims of $116,000 for counsel fees and $240,000 for lands in Chattanooga sold to the company by John C. Stanton.

Erie.

At an adjourned meeting of the English holders of Erie securities in London, Jan. 4, Sir Edward Watkin moved that the plan of the committee be adopted, subject to such modification of the details as the committee may think necessary or expedient after consultation with President Jewett and the representatives of the American bond and stockholders. A resolution was adopted unanimously directing that a committee be appointed with power to carry out the plan, and that Gov. Tilden be requested to act as referee or arbitrator, to decide all questions that may arise in its completion and execution.

Another cable dispatch says of the meeting: "It was both crowded and ill-tempered, and much misunderstanding evidently existed. Sir Edward Watkin said that ten millions of pounds sterling had been squandered. The company has claims amounting to four millions of pounds against three English firms. Much had been squandered in stock exchange operations in endeavoring to sustain the market. It was proposed to call a court of arbitration in America for the purpose of settling all disputes. Governor Tilden would be asked to preside over the court. Mr. Ayres dissented from the committee's plan, saying that he considered it tantamount to presenting the company with a half a million of pounds, and he proposed the alternative scheme of raising a million of pounds on the first lien bonds, with 7 per cent. interest, redeemable in ten years. After an excited debate the amendment was withdrawn, and Sir Edward Watkin's proposition was finally adopted. The chairman said that the money subscribed would not be allowed to get into the hands of American lawyers.

Receiver Jewett's reports for September, October and November have been filed with the Court. For September and October the report is as follows:

Balance, Sept. 1		$373,592 43
Transportation, freight	$2,795,355 23	
" passenger	850,216 22	
" mail and telegraph	106,340 12	
		$3,751,911 57
Train service		53,152 18
Old materials, interest, etc.		65,126 52
Receiver's certificates issued, less amount paid		145,000 00
Receipts earned before Receiver's appointment		29,665 04
Total		$4,418,447 74
Traffic balances, pay-rolls, supplies, salaries, etc.	$2,479,758 09	
Iron bridges	35,542 43	
Purchase of cars	50,729 17	
Interest on bonds	317,473 16	
Other interest	11,833 34	
Rents	42,132 76	
Taxes	11,511 55	
Paid on matters accruing before Receiver's appointment, including $495,000 loans	1,027,595 43	
		3,976,575 93
Balance to November		$441,871 81

The report for November is as follows:

Balance from October		$441,871 81
Transportation, freight	$1,719,911 48	
" passengers	352,027 44	
" telegraph	3,927 96	
		$2,075,266 88
Train service		15,937 55
Old materials, etc.		19,269 78
Receipts earned before Receiver's appointment		32,539 45
Total		$2,584,825 47
Traffic balances, pay-rolls, supplies, salaries, etc.	$1,506,389 23	
Iron bridges	23,157 97	
Purchase of engines and cars	54,985 33	
Interest on bonds	96,915 00	
Other interest	2,145 60	
Rents	38,126 96	
Taxes	8,818 33	
Loans	185,000 00	
Paid on matters accruing before Receiver's appointment	151,115 43	
		2,066,653 85
Balance to December		$518,171 62

The total amount of Receiver's certificates and notes issued up to Dec. 1 was $1,536,539.40, of which $750,000 were canceled, leaving $781,539.40 outstanding, a net reduction of $40,000 during the three months covered by the report.

Rockford, Rock Island & St. Louis.

Receiver Ferry reports for November as follows:

Balance from October	$52,585 92
Receipts during November	50,622 63
Total	$103,208 55
Disbursements for November	90,264 60
Balance Dec. 1	$12,943 95

Mr. Ferry states that in settling with the Indianapolis & St. Louis Company he paid the full amount credited to it on his books, and for which vouchers had been presented to him. There is, however, a claim for $4,200, originating in 1871, 1872 and 1873, which the officers of the Rockford Company refused to pay, and which was not entered on their books. He further says that from the money now on hand and to be collected he will have enough to pay all his own bills, amounting to $28,790.75, as well as $18,629 of intervening claims which he believes to be debts fairly contracted for supplies. He asks authority to make these payments.

The taxes for 1875 are due but the bills have not been presented. They must be paid out of the proceeds of the sale or left as a lien on the property to be paid by the purchasers. In conclusion Mr. Ferry asks the Court to fix a day when all claims must be presented for final adjudication, so that his accounts can be closed up.

The Court referred the report to H. W. Bishop, Master in Chancery, for examination and report.

Connecticut Valley.

Regular trains will soon be running on this company's line from Saybrook Point, Conn., northward to Springfield, Mass., giving that city a second outlet to tidewater on Long Island Sound. The line is expected, besides its local business, to develop a considerable through traffic, especially in coal and heavy freights, and negotiations are now pending for the establishment of a great coal depot at Saybrook. The length of the line is 74 miles, which is made up of the 44 miles of the Connecticut Valley, from Saybrook to Hartford; one mile of the Hartford, Providence & Fishkill to East Hartford, across the Connecticut; 21 miles of the Connecticut Central to the State line; 7 miles of the Springfield & New London to the Athol Junction, and one mile of the Springfield,

Athol & Northeastern into the city of Springfield. The rentals paid by the Valley Company will be $5,000 for the use of the Athol track and depot in Springfield; $8,000 for the Springfield & New London road; $28,000 for the Connecticut Central; $2,000 for the use of the Hartford depot, and probably $2,000 more for the Providence Company's bridge over the Connecticut, making $45,000 per year in all, or about $1,500 per mile of leased road. Business going north of Springfield will be transferred to the Athol road at the junction.

Nashua, Acton & Boston.

An agreement has been made for the lease of this road to the Concord Railroad Company for a period of 10 years on terms not made public. The road is 24 miles long, from Nashua, N. H., southward to Concord Junction, Mass., where it connects with the Fitchburg and the Framingham & Lowell Division of the Boston, Clinton & Fitchburg. The business of the road has heretofore been very light, but the lease is of considerable local importance, as it gives the Concord Company control of a line of its own out of Nashua and a choice of two routes to Boston. It is probable that much of the through business from the Concord and the upper roads, of which the Concord is the outlet, will hereafter go over this road instead of the Lowell.

Free Passes in New England.

It is said that an agreement has been made by the Boston & Maine, the Boston & Lowell, the Fitchburg and the Eastern companies that no free passes shall be issued this year to officers of the Federal Government, or of the State, except the Governor and Council, or of municipal corporations, to members of the press, hotel proprietors, stage drivers, or for the purpose of influencing business. It is said that on some of the roads as much as one-tenth of the travel has been on free passes, so great has been the recent growth of the evil.

Boston, Hoosac Tunnel, Albany & Western.

A conference was held in New York Dec. 30 by several parties interested in this projected new line from Boston to the West and the Pennsylvania coal fields by way of the Hoosac Tunnel. A number of speeches were made and appointments made for future meetings.

South Carolina Railroad Taxation.

The Attorney General of the State of South Carolina reports as follows on the present position of the claims of the State to tax the railroads within its limits.

1. The suits against the South Carolina Railroad have been settled by a compromise, which has been confirmed by decree of court. The State reduces the rate assessed for past years, and the company concedes the right to tax hereafter the line from Charleston to Hamburg, and all the property and improvements in Charleston, with all the property derived by the present corporation from the old South Carolina Canal & Railroad Company and the improvements thereon, such property and improvements to be taxed in the proportion of the 136 taxable miles from Charleston to Hamburg to the 106 exempt miles from Branchville to Columbia and Camden; that is, 136-242 of such property will be liable to tax.

2. No decision has been given by the United States Circuit Court in the suit to enjoin the collection of taxes from the Savannah & Charleston road.

3. The United States Circuit Court has decided that the property of the Atlanta & Richmond Air Line is exempt from tax, and the State has taken an appeal from that decision.

Santa Cruz.

The track is now all laid on this road, which extends from the port of Santa Cruz, Cal., east along Monterey Bay through Soquel and thence southeast to a junction with the Coast Line of the Southern Pacific at Watsonville. The track is now being ballasted and levelled up, and the fencing is done from Santa Cruz as far as the Pajaro Slough. A passenger depot has been commenced near the shops in Santa Cruz, and everything will soon be ready for business. The road is 20 miles long, of three-feet gauge and is intended for local traffic mainly, although it is proposed to make a link in a long narrow-gauge line to extend from San Francisco along the coast.

Sonoma & Marin.

As many men as can be employed are at work in the tunnel through the Puerto Suello, and work progresses night and day. The material is soft and easily removed.

Pacific, of Missouri.

The meeting of stockholders in New York was continued Dec. 29. Mr. George, of Boston, offered resolutions providing for a committee of five to investigate the company's affairs and arrange for an arbitration of all differences with the Atlantic & Pacific. Mr. Bowman, of St. Louis, made a long address severely animadverting upon the present management. He thought the real value of the stock was greater than its present selling price, if the road were properly managed. He spoke in very severe terms of the action taken in November last, when the board voted to accept a surrender of the property by the lessees and authorized the President to make a contract accepting such surrender as a full satisfaction for all claims under the lease. He read a communication complaining of the condition of the road, and in conclusion offered the following, as a substitute for Mr. George's resolutions:

"*Resolved*, That it is the wish of the stockholders of the Pacific Railroad that a separate receiver be appointed for the Missouri road, and that no person be appointed as receiver who holds third-mortgage bonds, or who is interested in the Atlantic & Pacific Company, and that at as early a day as practicable the Court be requested to order a new election for directors of the Missouri Pacific road."

Mr. George opposed it in a long speech, but it was carried by a stock vote of 29,868 to 6,351, the St. Louis County stock, 4,038 shares, being ruled out. The meeting then adjourned subject to the call of the Secretary.

San Francisco & North Pacific.

About 125 white men and 225 Chinese are employed on the grading of the branch from Fulton to Guerneville and on the bridge over Russian River. The progress made is not very rapid, however, as it is not thought that the branch, which is 15 miles long, will be finished before next summer.

Central Pacific.

It is said that work will soon be resumed on the loop line from Oakland by Martinez and Antioch to the main line at Banta's. Considerable grading was done on this line two or three years ago. It is intended to shorten the distance a little and to avoid the high grades about the Livermore Pass.

Spartanburg & Union.

The South Carolina Supreme Court has affirmed the decision of the lower court that the bonds, unpaid coupons and interest on the coupons are to be paid without preference and *pro rata* out of the proceeds of the sale of the road, and that the judgment of $30,000 existing before the indorsement of the bonds by the State, and claimed to have been postponed, does not have a lien in preference to the bonds and coupons.

Chicago, Millington & Western.

This company has presented a memorial to the Chicago City Council, asking permission to construct an elevated railroad in that City. The plan proposed is to run on the street grade from the city line through Lexington street to Rockwell street, thence to elevate the road through Lexington and Polk to Canal street, and through Canal to Lake. The intention appears to be to build a structure somewhat similar to the Elevated Railroad in New York, and to use thereon fireless locomotives or some similar motive power. The track of the road is laid from the west line of Chicago, west, through Riverside, across Cook County to the east line of Dupage, about 11 miles.

Chesapeake & Ohio.

In the United States Circuit Court at Alexandria, Jan. 3, the opinion of the Court in this case was delivered by Judge Bond, Chief Justice Waite concurring, though not present. Two motions were before the Court, one on the part of the defendants to dismiss the suit for want of jurisdiction; the other on behalf of the plaintiffs for an order of discontinuance, in order that they might proceed in the State courts, whose jurisdiction in the case is unquestioned. The Court decided to dismiss the case and enter an order directing Receiver Tyson to settle his accounts, preparatory to his discharge, after which the parties could proceed in the State courts. The Court fixed Jan. 20 as the date for Mr. Tyson's settlement, counsel for both parties agreeing.

As soon as the settlement is completed the road will pass into the hands of Gen. W. C. Wickham, Vice-President of the company, who has already been appointed Receiver by the Virginia court. It is understood that the foreclosure suit will then be pressed to completion, the road sold and the company reorganized as soon as possible.

A circular has been issued by the committee consisting of C. L. Perkins, Jesse Hoyt and L. H. Meyer, urging upon bondholders objections against the plan of reorganization proposed by the present management. It is charged that this plan is in the interest of the second-mortgage bondholders; that it proposes to give them $1,500,000 of the new first-mortgage bonds, to which they have no right; that it will give first-mortgage bondholders less interest return than this committee's plan; that it gives the control of the company to the junior interests; that it proposes to increase the debt in face of the fact that the road cannot be made to pay interest on the present amount; that no provision is made for the old Virginia Central bonds, and that it ignores the just rights of the first-mortgage. The committee claim that their plan, on the other hand, gives the control to the first-mortgage bondholders; that, while reducing the absolute debt, it gives the first-mortgage bondholders a claim on the net earnings in the form of preferred stock; that it provides for the old liens and the completion of the Western connections of the line, and that it strictly regards the priorities of all the existing interests.

Canadian Pacific.

Respecting the recent minute of Council, the Toronto *Globe* says: "It will be recollected that, when Mr. Mackenzie assumed office, he found great dissatisfaction existing in British Columbia in consequence of the failure of the Canadian Pacific Railway policy of the late Administration. After considerable negotiations the Canadian Government agreed, on the suggestion of the Colonial Secretary, to new terms, of which the most important were the construction of a local railway from Nanaimo to Victoria, in Vancouver's Island; the expenditure of not less than $2,000,000 per annum upon railway construction in the Provinces, after location, until the Pacific Railroad should be completed through the British Columbia section; and the completion of the railroad from Lake Superior to the Pacific by the year 1890. * * *

"The minute of the Council recapitulates the circumstances arising out of the original agreement or terms of union in 1871; the mission of Mr. Edgar in 1874, and the new terms finally adopted by both parties as a final settlement of all difficulties. The minute then calls attention to the fact that 'every step in the negotiations was necessarily predicated upon and subject to the conditions of the resolution of the House of Commons passed in 1871, contemporaneously with the adoption of the Terms of Union with British Columbia, subsequently enacted in the Canadian Pacific Railway Act of 1872, and subsequently re-enacted (after a large addition had been made to the rate of taxation) in the Canadian Pacific Railway Act of 1874; that the public aid to be given to secure the accomplishment of the undertaking should consist of such liberal grants of land and such subsidy in money or other aid, *not increasing the then existing rate of taxation*, as the Parliament of Canada shall thereafter determine.'

"The minute points out that the course of the Government of Canada must be subject to this condition 'thrice recorded in the journals of the House of Commons.' It refers to the several features of the new terms, and urges that the Vancouver's Island Railway is a work essentially local in its character, and one, therefore, that should under ordinary circumstances be undertaken by the Local Government. It is then proposed that the British Columbians should relieve the Government of Canada of the obligation to build the Canadian Pacific Railway, accepting in lieu thereof, and as compensation for any delays that may take place in the construction of the Pacific Railway, a bonus of $750,000, to be applied either towards the local railway or other public works, Canada also surrendering any claim to lands which may have been reserved in Vancouver Island for railway purposes. If this proposal be accepted the Government will be prepared to submit to Parliament at its forthcoming session the measure necessary to give it effect. We observe that, concurrently with the publication in Victoria of these dispatches the announcement is made of an early meeting of the Local Legislature, so that the representatives of the Province will have an opportunity of expressing their opinion on the matter before the Dominion Parliament is called upon to legislate in the premises."

Davenport & St. Paul.

Efforts are being made to induce the companies to put in a transfer switch at Oxford Junction, Ia., where this road intersects the Sabula, Ackley & Dakota. All freight now has to be transferred at that point as there is no track connection between the two roads.

Marietta & North Georgia.

A meeting was to be held in Ellijay, Ga., Jan. 6, for the purpose of making arrangements to change the line of this projected road so that instead of running to Ducktown it will connect with the Western North Carolina at Murphy, N. C.

Illinois Central.

This company reports to the State Auditor of Illinois that its earnings in Illinois for the six months ending Oct. 31 were $2,792,952.20, on which the 7 per cent. tax due the State was $195,506.65, which has been paid into the treasury.

Wheeling & Lake Erie.

At the annual meeting in Leesville, O., Dec. 21, a motion was made that the road from the intersection of the Valley Railroad at Zoar to Wheeling, about 40 miles, should be built and owned in common with the Valley Company. A motion to make the road a narrow-gauge was deferred for future consideration. President Wood reported that President Garrett, of the Baltimore & Ohio, had expressed himself as favorable to the completion of the Wheeling & Lake Erie.

River Falls & Hudson.

Arrangements are being made to organize a company for the purpose of building a railroad from River Falls, Wis., northwest to Hudson, about 15 miles.

Utica, Ithaca & Elmira.

The Syracuse (N. Y.) *Journal* of recent date says: "The opening of this line for through travel has been delayed for two weeks by the construction of three miles of independent road parallel to the Ithaca & Athens railroad, between Spencer and Van Etten, but it will be open for traffic the coming week. It is proposed to run four passenger and mixed trains daily between Syracuse and Elmira, both by way of Auburn by the Southern Central and by the Syracuse & Binghamton at Cortland. * * * *

"The trains of the Utica, Ithaca & Elmira railroad are to run direct to Corning by a third rail on the Erie the present winter, and when completed the cars will run through between Syracuse and Elmira and Corning for freight and passengers without change.

"General Burt, the President of the road, informs us that the surveys for the Syracuse extension are now completed, and the line will be graded this winter in season to be opened for use the coming summer, when the Lawrenceville & Elmira line will be finished, and the cars from the Morris Run and Blossburg mines will run from the mines to Syracuse over an independent road without change. All the work is being pushed energetically, and this new line from the bituminous coal fields and southwestern Pennsylvania to Syracuse, and through Syracuse to northern New York and Canada, will be opened for traffic before midsummer. The line surveyed into Syracuse runs from Truxton through the Labrador valley to Apulia, through Jamesville and DeWitt to the New York Central freight yards at East Syracuse, and comes into Syracuse over the Central tracks and also over the Syracuse & Chenango tracks, the latter giving the best connections for northern business."

Chesapeake & Ohio Canal.

Navigation is entirely closed for the season and the usual winter repairs have been begun.

Junction & Breakwater.

It is said that an extension will be built in the Spring from Lewes, Del., to Rehoboth Beach, where there is a noted summer resort and camp-meeting ground. The distance is six miles.

Texas & Pacific.

The Tarrant County Construction Company is making good progress with the grading from Fort Worth, Tex., east to the present terminus at Eagle Ford. Vice-President Bond has promised that the rails will be on hand some time this month.

Eastern.

Reports have been current in Boston of the discovery that $250,000 of bonds had been issued in excess of the amount standing on the books of the company. This, however, is not generally credited.

Indianapolis, Bloomington & Western.

The Indianapolis *Journal* says: "Gen. George B. Wright, Receiver of the Indianapolis, Bloomington & Western road, is preparing to pay the employes a portion of their back pay. The whole amount due the employes will not exceed $138,000. Since the road passed under his control the employes have been paid regularly, and he has not incurred a liability which has not been met promptly when due."

Montclair & Greenwood Lake.

The new equipment bought by the new company and the repairs being made on the road, enable it now for the first time to compete seriously for suburban travel with other roads. Accordingly a war on a small scale has been begun with the Delaware, Lackawanna & Western, and fares between Bloomfield and Montclair and New York have been reduced nearly one-half.

Portland & Ogdensburg.

Through trains now run daily over the whole line from Portland, Me., to Johnson, Vt., a distance of 193 miles. The line is at present made up of the Portland & Ogdensburg road from Portland to Fabyan's, N. H., 91 miles, whence trains run over the Boston, Concord & Montreal branch line to Wing Road, 13 miles, then over the main line of the same road to Scott's Mills, eight miles further. Here the line leaves the Boston, Concord & Montreal track and runs westward 2½ miles to the Connecticut River, 114 miles from Portland, crossing which it meets the Vermont Division in the town of Lunenburg, Vt. From this point that division is now completed 79 miles to Johnson, from which point to Swanton work is actively progressing. At Wing Road, the junction of the Boston, Concord & Montreal main and branch lines, a Y has been put in to facilitate the passage of trains, and this road will continue to be used until the company's own line is completed.

The Montreal, Portland & Boston road, which is to give this line its Montreal connection, has secured its subsidy from the Quebec Government, and work will be pushed as soon as the weather will allow.

Philadelphia & Reading.

It is announced that McCalmont Brothers, in London, Jan. 1, brought out £2,000,000, ($10,000,000) bonds issued under the general mortgage of this company, and that the entire issue was promptly taken. The credit of this company stands very high in England, where its issues are largely held.

North Pennsylvania.

The Delaware River Branch, which is to form part of the new line from Philadelphia to New York, has now all the track laid, and is being made ready for use. It leaves the main line at Jenkintown, Pa., nine miles from the Berks street depot in Philadelphia, and runs northeast, by Huntington Valley, Brownsville and Attleboro to the Delaware River at Yardleyville, where it meets the Delaware & Bound Brook Railroad of New Jersey.

Wisconsin Central.

The track of the branch or extension from Stevens Point, Wis., to Portage has been laid from Stevens Point southward to Plainfield, 23 miles. The Governor of Wisconsin a few days since inspected the first section of 20 miles, preparatory to issuing the certificate for the land grant.

Cairo & St. Louis.

The operations for the month of November are reported as follows:

Gross earnings ($193 per mile)	$38,267 66
Ordinary expenses (78.90 per cent.)	$22,305 33
Rentals, etc.	2,486 66
Total expenses (87.70 per cent.)	$24,791 99
Net earnings ($24 per mile)	$3,475 67

During the month passenger trains ran 10,421 miles, freight trains 12,414 miles and coal trains 8,128 miles, a total of 30,963 miles. The average earnings per train mile were 64.03 cents for passenger, 92.81 cents for freight and 123.89 cents for coal trains. The earnings continue light.

Pittsburgh, Washington & Baltimore.

Under the terms of the lease lately concluded, this road passed into the direct possession of the Baltimore & Ohio, which has long indirectly controlled it, Jan. 1.

On the same day, in London, Messrs. J. S. Morgan & Co. brought out £1,350,000 ($6,750,000) bonds issued under the new consolidated mortgage for $11,000,000, and guaranteed by the Baltimore & Ohio Company. The telegraph announces that the bonds were all promptly taken.

Toledo, Paw Paw & South Haven.

Meetings are being held to advocate the construction of a narrow-gauge railroad to run from Toledo, O., westward through Morenci, Mich., Fremont, Orland and Lima in Indiana to White Pigeon, Mich., running so far nearly parallel

with and close to the southern boundary of Michigan and about half way between the main and air lines of the Lake Shore & Michigan Southern. At White Pigeon it is proposed to take a sharp bend and run north by west to Lawton on the Michigan Central, then over the Paw Paw road to Paw Paw, and thence northwest to South Haven on Lake Michigan. The road would be about 170 miles long and would run through a country already well provided with railroads.

The Illinois Canal Commission Report.

The report of the Illinois Board of Canal Commissioners for the year ending Nov. 30 states that the organization of the board continues the same as last year's report. There has been great trouble experienced with grass accumulating on the Morris level, and travel was interrupted for five days during the season by the work of clearing it away. Some trouble was also experienced by the breaking of a span in the Kankakee aqueduct. With these exceptions navigation has been uninterrupted from April 15 last until Nov. 28. There has been a reduction in the cost of ordinary repairs during the season, of $2,898 and an increase of extraordinary of $3,611.

The receipts and expenses for the year were as follows:

	1875.	1874.	Inc. or Dec.	P. c.
Canal tolls and lockage at Henry	$149,120 18	$153,341 61	Dec.. $11,221 43	7.3
Expenses of canal	74,511 86	73,794 38	Inc.. 717 48	1.0
Balance	$67,608 32	$79,547 23	Dec.. $11,938 91	15.0

After making all deductions the net revenue of the canal and lock for 1875 is $54,040.08, being nearly $6,000 less than the estimate in the last report. The prospect for business next year is more encouraging from the fact that very large crops of grain have been raised this season along the line of the canal and Illinois River.

The foundations of the lock and dam at Copperas Creek have been completed, and the walls laid to the height of 6¼ feet. The work done by the State amounts to $61,724.84.

On this work the State has expended $11,367.33, and the United States $62,339.80 on the foundations. The total estimate of cost including contingencies was $400,722.12, the contract for the dam and lock being $298,549. Deducting the cost of the foundation and the whole amount expended on the work, there will be needed to complete it $159,185, to meet which there is a balance of $61,412.28 to the credit of the Commissioners, leaving $97,772.72 to be provided for. If the tolls on the canal and lock at Henry are sufficient this next season, of which there is not much doubt, the lock and dam at Copperas Creek will be completed by the close of navigation of 1876, provided also that the water on the Illinois River should be low enough during the summer months to admit of the dam being built.

Tensas & Tallulah.

It is proposed to build a narrow-gauge road from St. Joseph, in Tensas Parish, La., northward on the west side of Lake Bruen and Lake St. Joseph and thence up Bayou Vidal to the Vicksburg, Shreveport & Texas at Tallulah, a distance of nearly 40 miles.

South Mountain & Boston.

It is reported that the junction with the New Jersey Midland will not be made at Deckertown after all, but that the road will cross the Midland south of Deckertown and run up the west side of the Wallkill Valley to Pine Island, where it will connect with a branch of the Erie from Goshen. The reason given is the reluctance of the people of Deckertown and Wantage township to subscribe to the stock and to take bonds in payment for supplies; possibly also the expected failure of the negotiations for the purchase of the Midland.

Atchison, Topeka & Santa Fe.

The track of the Pueblo & Arkansas Valley road, which is the extension of this road to Pueblo, is laid to Rocky Ford, Col., 15½ miles beyond the late terminus at King's Ferry, and 35½ miles westward from West Las Animas. There remain 47½ miles of track to reach Pueblo, on which work is progressing rapidly.

St. Louis, Marine & Edwardsville.

This company has filed articles of incorporation in Illinois and purposes building a railroad from Edwardsville, Ill., eastward 10 miles to the village of Marine. The capital stock is fixed at $200,000 and the corporators are Jos. Gillespie, J. C. Robinson, J. B. West, H. H. Handlew, D. P. Fisher, H. C. Gerke and C. D. Holles.

Bloomington, Lacon & Northwestern.

This latest narrow-gauge project is for a line from Bloomington, Ill., northwest to Savannah on the Mississippi, about 140 miles. It would run through a country already well provided with railroads.

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New Haven & Northampton.

This company during the fiscal year ending Sept. 30 worked the same lines as during the previous year, a main line from New Haven, Conn., to Williamsburg, Mass., 83.88 miles; a branch from Farmington, Conn., to New Hartford, 14.09 miles; a branch from Simsbury, Conn., to Tariffville, 1.04 miles, and the leased Holyoke & Westfield road, from Westfield, Mass., to Holyoke, 10.32 miles, a total of 99.01 miles owned and 109.33 miles worked.

The equipment consists of 20 engines and 1 snow-plow; 17 passenger and 8 baggage cars; 103 box, 300 flat and coal and 6 caboose cars; 1 tool, 1 derrick and 40 four-wheel gravel cars.

The property is represented as follows:

Capital stock ($24,848 per mile)	$2,460,000
Funded debt ($21,838 per mile)	2,162,000
Total ($46,687 per mile)	$4,622,000

Of the funded debt $1,278,000 are first-mortgage 7 per cent. bonds, and $884,000 convertible 6 per cent. bonds. The company owns $20,000 Holyoke & Westfield stock, and has advanced $179,685.54 for the construction of that road.

The work done for the year was as follows:

	1874-75.	1873-74.	Inc. or Dec.	P. c.
Train mileage	371,561	399,400	Dec.. 27,839	7.0
Passengers carried	333,163	372,928	Dec.. 39,765	10.7
Passenger mileage	4,926,390	5,528,198	Dec.. 601,808	10.9
Tons freight moved	257,322	277,874	Dec.. 20,552	7.4
Tonnage mileage	10,107,674	12,779,119	Dec.. 2,671,445	20.9

The average receipts per passenger per mile were 2.96 cents; per ton per mile, 3.92 cents. The earnings for the year were as follows:

	1874-75.	1873-74.	Inc. or Dec.	P. c.
From freight	$396,500 92	$440,170 21	Dec. $43,669 29	9.9
Passengers	145,801 26	164,334 38	Dec. 18,833 12	11.5
Mails and express	28,792 88	22,529 52	Inc. 6,263 36	27.8
Other sources	24,369 28	22,611 22	Inc. 1,758 06	7.8
Total earnings	$595,164 34	$649,645 33	Dec. $54,480 99	8.4
Working expenses	372,640 57	428,599 58	Dec. 55,958 01	13.1
Taxes	26,609 96	27,915 75	Dec. 1,305 79	4.7
Total expenses	$399,250 53	$456,514 33	Dec. $57,263 80	12.5
Net earnings	$195,913 81	$193,131 00	Inc. $2,782 81	1.4
Gross earn. per mile	$5,444	$5,942	Dec. $498	8.4
Net earn. per mile	1.792	1,766	Inc. 26	1.4
Per cent. of expenses	62.61	65.97	Dec. 3.36	5.1
Per cent. of exps. and taxes	67.08	70.27	Dec. 3.19	4.6

The income account for the year is as follows:

Net earnings		$195,913 81
Sale of 7 per cent. bonds		278,080 00
Balance of accounts		13,675 17
Material on hand		65,790 99
October coupons		19,995 00
Total		$573,404 97
Interest account	$176,901 17	
Old dividends	387 00	
Bills payable	186,800 00	
Holyoke & Westfield rent and interest	16,263 64	
Construction and equipment	86,663 59	
Discount on bonds sold	3,000 00	
Sundry judgments	11,034 14	
Sundry balances paid	34,491 40	
		515,540 94
Balances at close of year		$57,864 03

Of the falling off in receipts about $20,000 was in loss of transportation of ice and $9,000 from loss of the extra travel resulting from the Mill River disaster of the previous year. It is thought that the present year will show a slight improvement in earnings, and that the working expenses can be still further reduced.

During the year new depots were built at Simsbury, Unionville and Mt. Carmel, and one is now in progress at Plainville to replace the house burned down in June. Six iron bridges with stone abutments have been put up in place of old wooden ones. There has been put in the track 701½ tons of steel rails, and 28,532 new ties, and the sidings at several points have been lengthened. The road and equipment are in good condition and ready for a considerable increase of traffic.

Indianapolis, Bloomington & Western.

The lines worked by this company are as follows:

	Miles.
Main Line, Indianapolis, Ind., to Peoria, Ill.	211.50
Western Extension, Champaign, Ill., to Havana	100.63
White Heath, Ill., on Western Extension, to Decatur	30.91
Total	343.04

Of the main line 9.22 miles, from Pekin, Ill., to Peoria, is leased from the Indianapolis & Springfield Company, leaving 333.82 miles owned. The leased 922 miles is also used by the trains of the Toledo, Wabash & Western Company. The road has been in the hands of Gen. George B. Wright, as Receiver under suits for foreclosure of mortgage, for over a year, and he makes the following report for the year ending Nov. 30, 1875.

The capital account at that date was as follows:

Capital stock ($22,785 per mile)	$7,610,300
Bonded debt ($35,928 per mile)	12,000,000
Past-due coupons	519,280
Floating debt	3,597,220
Total ($71,088 per mile)	$23,726,700

The Receiver has paid $52,152.13 during the year on account of floating debt claims. He has made the following improvements in road and equipment: Rebuilt 7 locomotives, 3 passenger coaches, 2 chair cars, 475 freight cars; repairs were made to 18 locomotives, costing nearly as much as rebuilt engines. Nearly all the passenger coaches and baggage cars of the road have been repainted and refitted. During the year 64 miles of new iron and steel rails have been laid, 2¾ miles of new side track put in, 146,000 cross ties laid, 24 miles of track graveled; 13 bridges have been entirely rebuilt, 3 station houses built, and 6 stock-yards fitted up.

Concerning the equipment he says: "Immediately after the order of the court at its last term, relative to the lease of the cars of the Western Car Company, negotiations were opened with the officers of that company, and with other companies, for the procurement of cars. After diligent inquiry and negotiation your receiver entered into a new contract with said Western Car Company for the use of cars then remaining on the road for the period of one year from Sept. 1, 1875, at a monthly rental of $10 per car.

"The twenty-eight locomotives claimed by the Rogers Locomotive & Machine Works, of Paterson, N. J., are still in the possession of your receiver, and so many of them as have been needed have been used and cared for in the same manner as locomotives owned by the company. The suit pending in the United States Circuit Court for the District of Indiana, to recover possession of said locomotive engines, is still pending and undetermined. The receiver suggests that new engines and cars be purchased in sufficient numbers to supply the locomotives claimed by the Rogers Works and the cars leased; the purchase to be made upon favorable terms and easy payments, so that the payments would be upon purchase instead of rental. By this method the company can become the owner of the locomotives by paying in monthly installments a sum but little in excess of a reasonable rental."

The earnings of the main line, 211.5 miles, for the year were as follows:

From freight	$707,567 69
Passengers	359,594 39
Mails and express	45,434 19
Miscellaneous	60,836 68
Total ($5,548 per mile)	$1,173,432 95
Actual working expenses (89.85 per cent.)	1,054,320 92
Net earnings ($563 per mile)	$119,112 03
Extraordinary repairs	423,000 40
Deficit	$303,889 37

The earnings of the Western Extension, 131.54 miles, for the year were:

Earnings ($1,149 per mile)	$151,101 40
Working expenses (99.98 per cent.)	151,063 25
Net earnings ($0.29 per mile)	$38 15

The total amount of receipts and disbursements was as follows:

Receipts from all sources	$1,475,319 07
Disbursements on all accounts	1,403,064 30
Balance Dec. 1, 1875	$72,254 77

With respect to certain complaints made of his administration of affairs, the Receiver says:

"I have been able to apply only a very small proportion of the earnings in the direction of payment of back pay-rolls and supply bills. Such had been and was the credit of the company and the condition of the property at the time your Receiver took possession that nothing could be purchased without the most positive assurance of prompt payment out of the earnings, and any diversion of the earnings to the prejudice or delay in payment of current bills and pay-rolls would have compelled the suspension of the necessary improvements and left the property in such condition that it could not be operated advantageously or profitably. Much complaint has been made and great solicitude felt in regard to the back-pay due employes, and your Receiver has experienced great embarrassment on account of his inability to meet it under the orders of the court, but he is convinced that any attempt to pay more than he has done would have been a violation of the orders of the court, and directly to the prejudice of future earnings and ultimate payment of this and other just and equitable claims in full, which he hopes and believes can soon be reached, at least in part, through the improved condition of the property and the good promise of increased earnings in the future. It has been intimated that more has been done in the direction of improvements to the property than was absolutely necessary. Whoever has entertained such an opinion proves himself ignorant of the real condition of the property, and I respectfully refer to the sworn statements contained in my first report in this case, and to the needed improvements and repairs upon the property specified under that head in this report. It should not be forgotten that in many instances bondholders and other creditors are as great sufferers as employes. Notwithstanding the anxiety and solicitude of the agents and employes for the payment of back dues, I desire to bear testimony to their general forbearance and faithful exertions to increase the earnings, and in every way to aid in the proper administration of the trust. They are entitled to and receive my hearty thanks for their co-operation."

Regarding the leased section of the main line from Peoria to Pekin, the Receiver says: "The new contract of lease with the Peoria & Springfield Railroad Company, upon the order and approval of the court, and which went into effect May 13 last, (a copy of which is on file in this court), has thus far been maintained and carried out by your receiver, and the receiver of the said Peoria & Springfield Railroad. This lease has now been in operation a period of more than five months, during which time the receiver of the Peoria & Springfield Railroad has made large and valuable improvements upon the track, and important additions at Peoria, to facilitate the movement of trains, the care of locomotives and cars at that point. No serious embarrassment has arisen out of this new lease, but some parties interested in the matter claim that the interests of the Indianapolis, Bloomington & Western Railway Company, as well as those of the Peoria & Springfield Railroad Company, would be better served if the property of the latter company, within and between the cities of Peoria and Pekin, was under the exclusive control and management of the Indianapolis, Bloomington & Western Railway Company, either by purchase or under a just and equitable rental. So short a line of road, being the natural connection and outlet of the Indianapolis, Bloomington & Western Railway, it is claimed can hardly be managed separately to accommodate rival lines without exciting jealousies and giving rise to complaints."

Western Railroad Association.

The following circular has been issued to railroad managers by this Association, dated Chicago, Dec. 21, 1875:

The annual meeting of the Western Railroad Association will be held at the Grand Pacific Hotel, Chicago, on Tuesday, 11th January, 1876, at eleven a. m.

You are respectfully and earnestly invited to be present at that meeting, and then join your company to the Association. Three only of the reasons which might be urged for such action on your part are submitted. First. The Association is defraying the expenses of very important litigation in which your company is alike interested with its members. Your own interests seem to dictate that your company should have a voice in determining the course to be pursued in these important matters. Second. Almost every company in the country has upon its road devices which have been patented and for which it has not settled, and on which, if the patent or patents therefor are valid, damages are *daily* accruing. By submitting full descriptions of these devices to the Association, you can learn with reasonable definiteness whether the device has ever been patented, and if so, whether the patent upon it infringes any prior patent, and whether the device, if not itself patented, infringes any patent. Almost every company in the country has to consider during the year claims made for the alleged infringement of patents by devices in use, concerning which question of infringement and concerning the validity of which patents and their relations to other patents the company is not informed. The general solicitors of railroad companies can hardly give the necessary time to the consideration of this special, intricate and arbitrary branch of the law. To refer any *one* of the above cases to a competent patent attorney, and to act advisedly thereon, would cost about as much as the expenses of a company in this Association for an entire year. We have learned of a number of settlements made during the past year, by companies not in the Association, and aggregating thousands of dollars, which would have been saved to those companies had they consulted, as members, with the officers of this Association. Third. As the rate for a car load is less than for a small can, so are the rates of settlement for patent rights less for an aggregation of companies than for individual companies. More than the whole expenses of the Association for the past year were saved to our members in a single settlement effected.

The work of gathering necessary and valuable information, of contesting unjust claims, and of making advantageous settlements, cannot be done by individual companies with anything like the same dispatch, economy and convenience as when done by an association of companies for that purpose. This Association aims to do that work in the most effective and economical manner possible. Our membership now numbers forty companies. Our expenses for next year will be about $30,000, which will be equitably assessed upon the companies upon the basis of their gross earnings. It is hoped that twenty companies will join during the present month, and make the average expense to each company $500. We have given over *one hundred* reports upon patents and patent claims to members during the year, and have conducted a large amount of very important litigation, and are ready to give immediate reports upon over *two hundred* patents.

Important matters, which cannot well be mentioned herein, will be presented to the annual meeting, in which your advice and co-operation is solicited.

By order of the Executive Committee.

J. H. RAYMOND, Secretary.

The following is a list of the companies which were members of this Association at the date of the circular:

1. Atchison & Nebraska R. R.; 2. Atlantic and Pacific R. R.; 3. Atchison, Topeka & Santa Fe R. R.; 4. Burlington & Missouri River R. R. in Neb.; 5. Chicago & Alton R. R.; 6. Chicago, Burlington & Quincy R. R.; 7. Cleveland, Columbus, Cincinnati & Indianapolis R'y; 8. Cincinnati, Hamilton & Dayton R. R., 9. Cincinnati, Hamilton & Indianapolis R. R.; 10. Cincinnati, La Fayette & Chicago R. R.; 11. Cincinnati, Richmond & Chicago R. R.; 12. Cincinnati, Richmond & Fort Wayne R. R.; 13. Chicago & Michigan Lake Shore R. R.; 14. Chicago, Milwaukee & St. Paul R'y; 15. Chicago & Northwestern R'y; 16. Chicago, Rock Island & Pacific R. R.; 17. Dayton & Michigan R. R.; 18. Detroit, Lansing & Lake Michigan R. R.; 19. Detroit & Milwaukee R. R.; 20. Evansville & Crawfordsville R. R.; 21. Fort Wayne, Jackson & Saginaw R. R.; 22. Flint & Pere Marquette R. R.; 23. Grand Rapids & Indiana R. R.; 24. Hannibal & St. Joseph R. R.; 25. Illinois Central R. R.; 26. Kansas City, St. Joseph & Council Bluffs R. R.; 27. Leavenworth, Lawrence & Galveston R. R.; 28. Lake Shore & Michigan Southern R'y; 29. Michigan Central R. R.; 30. Missouri River, Fort Scott & Gulf R. R.; 31. Ohio & Mississippi R'y; 32. Quincy, Missouri & Pacific R. R.; 33. Rockford, Rock Island & St. Louis R. R.; 34. St. Louis, Kansas City & Northern R'y; 35. St. Paul & Pacific R. R.; 36. St. Paul & Sioux City R. R.; 37. Sioux City & St. Paul R. R.; 38. Toledo, Wabash & Western R'y; 39. Wisconsin Central R. R.; 40. Western Union R. R.

Mr. Robert Harris, Superintendent of the Chicago, Burlington & Quincy Railroad, is President; George Payson, Esq., Attorney, and Mr. J. H. Raymond, Secretary and Treasurer. The office is at No. 97 Washington street, Chicago.